International Journal of Medical Science and Clinical Inventions 4(7): 3129-3132, 2017
DOI:10.18535/ijmsci/v4i7.17 **ICV 2015: 52.82**
e-ISSN:2348-991X, p-ISSN: 2454-9576

Case Study

Transvaginal Sonographic Cervical Length Measurement as Predictor of Preterm Delivery

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Abstract: The present study entitled, "Transvaginal Sonographic cervical length measurement as predictor of Preterm delivery" was carried out on 150 cases of primiparas who attended the Govt. Medical College, Hospital, Nagpur. The transvaginal ultrasonographic cervical length was measured at 18 -20 weeks. These cases were followed at 24 weeks and 28 to 30 weeks for pregnancy outcome as abortion, preterm labour or full term delivery. The study was carried out to correlate the outcome of pregnancy (preterm delivery) with the transvaginal cervical length measured serially at 18-20 wks, 24 wks & 28-30 wks.
The mean cervical length was 41.9 at 18-20 weeks, 40.09 at 24 weeks and 37.41 at 28 to 30 weeks. The mean cervical length in patients who had preterm delivery was 22.67 at 18 to 20 weeks, 24 at 24 weeks and 18.50 at 28-30 weeks compared to 42.03, 40.3 and 32.41 respectively in those who had full term delivery. This difference was significant. The cervical length of </= 20 mm had sensitivity of 100%, CL </=30 mm had specificity of 80% and CL </= 20 mm strongly indicated the possibility of preterm labour. It is also concluded that the cervical length between 20-30mm is the high risk length & prophylactic encirclage can be undertaken in primigravidas considering this length.

Key Words: Mean cervical length, Pregnancy outcome, Prediction of preterm delivery, Transvaginal cervical length measurement.

INTRODUCTION

Preterm delivery remains a major source of perinatal mortality and morbidity. Part of the clinical problem arises from the absence of objective criteria for the prediction of preterm delivery. Improved management of this condition may result if patients at risk of preterm delivery could be identified before the onset of uterine activity.

Several studies have attempted to predict the onset of preterm labour using risk scoring systems based on digital examination of the cervix in third trimester. However this has limited role because it identifies only the outcome only in 30% population [(1 &2)].

Ultrasonic measurement of cervical length separates a group of pregnant women with threatening preterm birth, and opens the possibility of timely responses, thus avoiding unnecessary cerclage with possible adverse consequences. As in most medical dilemmas, as well as this, there are still no standardized criteria for ultrasound finding of cervix weakening. Currently the most important parameter is the shortening of the cervix length, but the exact values still varies [(3)].

Cervical shortening or effacement usually determined by manual vaginal examination and estimation of cervical length has been associated with increased risk of preterm delivery. It is because manual vaginal examination for measurement of cervical length is subjective and total accurate cervical length cannot be measured when the cervix is closed [(4,5)].

Transvaginal ultrasonographic measurement of cervical length is precise, objective and repeated measurements are consistent and accurate. Anderson et al (1990) [(6)] also suggested that a routine vaginal ultrasonographic cervical examination can be used to predict preterm delivery risk.

Theera Tongsong et al (1995) [(7)] in their study of single transvaginal sonographic Measurement of cervical Length early in third trimester as predictor of preterm labour noticed that the 12.5% cases had preterm labour as compared to 87.5% cases who delivered at or after 37 weeks. The mean cervical length in patients who delivered preterm was 34 +/- 6 mm as compared to 37+/- 6 in normal deliveries. This was statistically significant.

The present study is therefore undertaken to evaluate the transvaginal Sonographic Cervical Length measurement as predictor of Preterm delivery.

MATERIALS & METHODS

The present work was carried out at Obstetrics Unit of Department of Obstetrics and Gynaecology, Govt. Medical

College, Nagpur. The study was carried out during the period of April 2006 to March 2008. The study included total 150 cases. The clearance from institutional ethics committee was obtained before the start of the study.

OBJECTIVES OF THE STUDY

The present work was carried out with following objectives.

a) To measure the transvaginal cervical length at 18 -20 weeks in all cases.
b) To correlate the outcome of pregnancy (preterm delivery) with the transvaginal cervical length measured serially at 18-20 wks, 24 wks & 28-30 wks.

TYPE OF STUDY:- This was prospective observational study.

STUDY SETTING:- Govt. Medical College, Nagpur

INCLUSION CRITERIA

The cases who met with following criteria were included.

a) Singleton pregnancy at gestational period of 18 to 20 weeks without serious medical complications, cervical incompetence or foetal congenital anomalies.
b) History of regular menstruation and knowledge of exact date of last menstrual period and
c) Gestation age calculated from dates consistent with clinical estimation.

EXCLUSION CRITERIA

Following cases were excluded from the work.

a) Cases with multiple pregnancies.
b) Cases with significant medical illness like Diabetes Mellitus, Anaemia, Infections UTI, Vaginitis and previous cervical incompetence.
c) Cases who did not give consent for inclusion in the clinical study.

The preliminary clinical examination including the digital examination was done in all cases immediately after their inclusion in the study.

The transvaginal ultrasonographic vaginal examination was carried out in all cases using the real time 5-MHz transvaginal sector scanner (Aloka). All examinations were performed by same examiner who had no prior clinical information about the patient.

The procedure for performed after the bladder was emptied. The transvaginal sonographic examination was done with 5.0-MHz transvaginal probe. The internal cervical os was first visualized in the sagittal plane and adjusted until the entire cervical canal could be seen clearly. Electronic markers were placed at the furtherest points at which the cervical canal walls juxtaposed and then cervical length was measured. The length was measured between the two points between internal and external os. The cervical length was measured on two consecutive periods and the average from the two best measurements was taken as cervical length (Jonthan WT Ayers, 1988)[8].

Serial cervical lengths were measured at 18-20 weeks, 24 weeks and 28-30 weeks. All cases were followed till pregnancy outcome as abortion, preterm labour term labour.

Cases lost to follow up were excluded from the study.

The outcome of the study was the Correlation of cervical length at various periods with pregnancy outcome.

Data was analyzed using student t test.

RESULTS

The total number of cases included was 150. Out of these 5 cases lost for follow up. Hence the study included only 145 cases for follow up. The results are as under.

The age range was between 18 to 28 years with the mean age of 22.6 years.

1. THE CERVICAL LENGTH

The cervical length measurement by ultrasonography on admission was studied.The cervical length measurement at 18 – 20 weeks was less than 30 mm in 5 (3.45%) cases while in 21 cases (13.79%) it was between 31 to 45 mm. The cervical length more than 45 mm was noticed in 120 cases (82.76%).

Table 1: Mean cervical length in 145 cases at various weeks of Gestations

Weeks of Gestation	Mean cervical length(mm)
18-20	41.9
24	40.09
28-30	37.41

The mean cervical length at 18 to 20 weeks was 41.9, at 24 weeks it was 40.09 and at 28 to 30 weeks it was 37.41 mm.

2 : FOLLOW UP

All the women included in the study were followed till pregnancy outcome. Table No 3 shows the pregnancy outcome.

Table 2: pregnancy outcome

Total	Aborted	Preterm	Term
145	4	5	136
Percent	2.76	3.45	93.79

In the present study, out of 150 cases studied, 9 cases (6.21%) had either preterm delivery or had aborted. The full term delivery was noticed in 93.79% cases.

Table 3: Mean Cervical Length in patients and pregnancy outcome

Gestational age	Mean Cervical Length (mm)	
	Pts aborted or preterm delivery (n= 9)	Pts with full term delivery (n=136)
18-20	22.67	42.03
24	24	40.3
28-30	18.50	32.41

The mean cervical length at 18-20 weeks was 22.67 in cases who had abortion or preterm delivery while it was 42.03 in cases with full term delivery. Similarly Mean CL at 24 weeks and 28-30 weeks were 24 and 18.50 respectively in patients who aborted or had preterm delivery as against 40.3 and 32.41 at respective age of gestation in cases with full term delivery.

Table 4: The cut off point for cervical length in patients with pregnancy outcome

Cut off point of CL (mm)	Sensitivity	Specificity	1-specificity
20	100	0	0
25	60	0	40
30	20	2.20	80
35	0	26.47	100
40	0	50	100
45	0	66.17	100
50	0	80.14	100
55	0	91.17	100
60	0	92.64	100

It is therefore inferred that,

a) CL </=20 mm had sensitivity of 100%.

b) CL </=30 mm had specificity of 80%.

c) CL </=20 mm indicates the possibility of preterm labor.

The cervical length between 20-30mm is the high risk length & prophylactic encirclage can be undertaken in primigravidas considering this length.

Discussion

Ultrasonic measurement of cervical length separates a group of pregnant women with threatening preterm birth, and opens the possibility of timely responses, thus avoiding unnecessary cercalage with possible adverse consequences. As in most medical dilemmas, there are still no standardized criteria for ultrasound finding of cervix weakening. Currently the most important parameter is the shortening of the cervix length, but the exact values still vary.

Berghella et al (1967) [9] Defined ultrasound as a method for assessment of the length of the cervix and the prediction of preterm delivery. The authors have given special attention to proper technique of performance, which is essential for accurate results. Ultrasonic measurement of cervical length in comparison with clinical bimanual examination showed a better diagnostic value to assess the risk of preterm birth in the general population of pregnant women. A classic digital gynaecological examination in pregnancy also have been traditionally used in everyday practice and has not proved as effective in detecting cervical weakness as compared to ultrasonographic measurement because often the exterior mobility of the cervical canal wrongly declares pathological condition.

The ultrasound examination has the potential of providing objective assessment of cervical length [7]. The appearance and length of normal cervix by transabdominal and transvaginal ultrasonography have been reported by several investigators. [7, 10]

In the present work, the mean cervical length at 18-20 weeks was 22.67, at 24 weeks it was 24 and the same was 18.50 at 28 to 30 weeks. The occurrence of Preterm termination of pregnancy either as abortion or preterm delivery was 6.21%. This observation was similar to other workers.

Matijevic R & Grgic O (2004) [11] carried out sonographic assessment of cervical length and clinical examination in the second quarter. Total of 282 patients, asymptomatic, singleton pregnancy were included. Shortened cervix was found in 6/138 patients (4.3%). The incidence of preterm birth 16/282 patients or 5.7%. The Sensitivity was 57.1 and the positive predictive value of 66.7%. Shortened cervix had 12 times greater chance of preterm birth in low risk group. The authors concluded that the ultrasound evaluation has better diagnostic accuracy in predicting preterm birth in relation to digital examination in low-risk group.

In the present work, the CL </= 20 mm had sensitivity of 100%, CL </=30 mm had specificity of 80% and CL </= 20 mm strongly indicated the possibility of preterm labour.

It is also concluded that the cervical length between 20-30mm is the high risk length & prophylactic encirclage can be undertaken in primigravidas considering this length.

CONCLUSION

In the present work, the **T**ransvaginal Sonographic cervical length measurement was evaluated as predictor of preterm delivery. The occurrence of preterm pregnancy outcome (either as abortion or preterm delivery) was noticed in 6.21% cases. The short cervical length was well correlated with the premature outcome of delivery. The cervical length of </= 20 mm had sensitivity of 100%, CL </=30 mm had specificity of 80% and CL </= 20 mm strongly indicated the possibility of preterm labour. It is also concluded that the cervical length between 20-30mm is the high risk length & prophylactic encirclage can be undertaken in primigravidas considering this length.

ACKNOWLEDGEMENT

The authors are thankful to Professor & Head, Department of Gynaecology and Dean, Govt. Medical College, Nagpur for permitting us to carry out this work and helped to make this project successful.

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