Radiodiagnosis

MEASUREMENT OF CERVICAL LENGTH USING ULTRASONOGRAPHY IN PREDICTING PRETERM LABOUR

Dr A Sri Ramya	Post graduate student, Department of Radiology, Bharati Vidyapeeth Deemed University Medical College, Pune-satara road, Dhankawadi, Pune-411043.
Dr Mahajan Mangal S*	Associate professor, Department of Radiology, Bharati Vidyapeeth Deemed University Medical College, Pune-satara road, Dhankawadi, Pune-411043. *Corresponding Author
Dr Joshi Priscilla C	Professor & Head of Department, Radiology, Department of Radiology, Bharati Vidyapeeth Deemed University Medical College, Pune-satara road, Dhankawadi, Pune-411043.

ABSTRACT Preterm labor is a major issue in developing countries. Short cervical length is one of the early marker of the preterm labor. Predicting the occurrence of preterm labor by identifying short cervix helps in planning the pregnancy and necessary early intervention hence improving the pregnancy outcome.

Aim and Objective: To find out the effectiveness of assessment of cervical length by transvaginal ultrasonography in predicting preterm delivery.

Methods and Material: This was a prospective cross sectional qualitative study over the period of 22 months. Total 433 patients forms the study group. All these patients were followed up till delivery & the results were compared. Inference was derived on the basis of comparison of short cervical length related to the preterm labor.

Results: Out of 433 patients, 382 patients delivered full term. In 382 patients, 25 had short cervical length (6.54%) and remaining 357 had normal cervical length (93.45%). Out of 433 patients, 51 patients delivered preterm. In 51 patients, 8 had normal cervical length (15.68%) and remaining 43 had short cervical length (84.31%). Our study showed sensitivity of 63.2 %, specificity of 97.8%, positive predictive value of 84.3%, and negative predictive value of 93.4%.

Conclusions: Predicting spontaneous preterm birth helps in early intervention and improvement in outcome.

KEYWORDS : Cervical length, preterm labour, ultrasonography.

Introduction

Preterm labour refers to the onset of uterine contractions of sufficient strength and frequency to effect progressive dilatation and effacement of the cervix between 20 and 37 weeks of gestation. Preterm deliveries with its associated mortality and morbidity still represents one of the major unsolved problems in Obstetrics. Preterm birth complicates 5-10% of pregnancies, but accounts for 85% of perinatal morbidity and mortality[1-2]. The estimated worldwide incidence of preterm birth in 2005 reported by World Health Organization is: World: 9.6%; Asia: 9.1%[1-2].The incidence of preterm birth in India is estimated to be 11-14%[3-4].Socio-economic factors like young maternal age, low maternal weight, poor nutritional status, illiteracy, uncontrolled fertility, poor sanitation and hygiene causing endemic diseases and general ill-health, hard manual work, lack of prenatal care, broken homes, unmarried status, substance abuse, and an emotional stress continue to adversely affect the incidence of preterm births[5-6].Treatment of preterm babies is very expensive and unaffordable in developing countries like India. Many attempts have been made to develop methods that may help us to predict the onset of preterm labour so that measures could be taken to prevent its occurrence. One of the earliest indicators of preterm onset of labour is shortening of the cervix. Currently there is no strong evidence to support routine cervical assessment using ultrasound for the purpose of predicting preterm delivery[7-8]. This is an attempt to find out the relation of cervical length measurement between 18 and 22 weeks by ultrasonography with the risk of preterm labour[8-9].

Aim and Objective :

To find out the effectiveness of assessment of cervical length by transvaginal ultrasonography in predicting preterm delivery.

Material and Method:

The study was conducted in the Department of Radiodiagnosis and Imaging, Bharati Vidyapeeth University and Medical College and Hospital, Pune between July 2016 to April 2018. This was a prospective cross sectional qualitative study. Patients below 18 years of age, multiple gestation, multigravida, with history of previous cervical surgery and medical and surgical conditions complicating pregnancy were excluded from the study. Total 480 primigravida patients presented between 18 to 22 weeks of gestation were studied during the period of 22 months. 39 patients had some associated gestational medical abnormalities and 8 patients had twin pregnancies

and were excluded from this study. Remaining 433 patients forms the study group. Written and informed consent was taken. The clinical history and examination finding was recorded in a case record form. These patients were assessed by using endocavitatory probe on Ultrasound Machines: Affinity 50, Affinity 70, Philips HD 11, Philips HD 5and Philips IU 22. All these patients were followed up till delivery & the results were compared. Inference was derived on the basis of comparison of short cervical length related to the preterm labor (Figure 1).
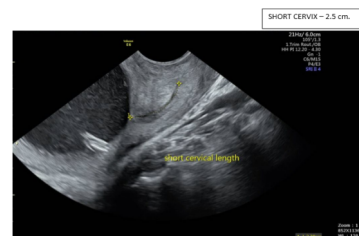
Figure 1: Transvaginal sonography in a 24 year old primigravida patient with 20 weeks intrauterine gestation showed cervical length of 2.39 cm. This patient was followed till delivery and found to have preterm labor at 35 weeks of gestation.

Result:

Total 433 patients formed the study group. Out of 433 patients, 382 patients delivered full term (88.22%). In 382 patients, 25 had short cervical length (6.54%) and remaining 357 had normal cervical length (93.45%). Out of 433 patients, 51 patients delivered preterm (11.77%). In 51 patients, 8 had normal cervical length (15.68%) and remaining 43 had short cervical length (84.31%) (Table 1 & 2 and graph 1 & 2).

Table 1: Distribution of the patients with normal and short cervical length in preterm and term delivery

| Patients	Patients with short cervical length	Patients with normal cervical length	Total no. of patients
Patients of term delivery	25	357	382
Patients of preterm delivery	43	8	51
Total no. of patients	68	365	433

Table 2: Distribution of the patients with normal and short cervical length in preterm delivery

Patients	Percentage of patients with short cervical length	Percentage of patients with normal cervical length	Total Percentage
Patients of preterm delivery	84.31	15.68	100

Graph 1: Graphic representation of the patients with normal and short cervical length in preterm and term delivery
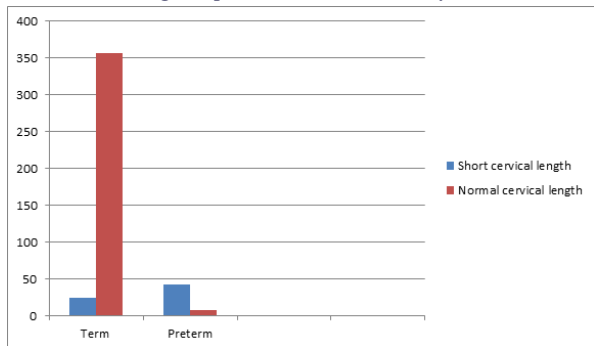
Graph 2: Graphic representation of the patients with short and normal cervical length in preterm delivery
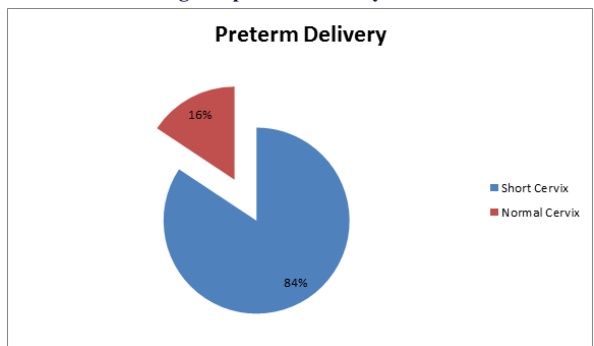
Discussion:

Preterm labor refers to the onset of uterine contractions of sufficient strength and frequency to effect progressive dilatation and effacement of the cervix between 20 and 37 weeks of gestation. It occurs in approximately 5-15% of all deliveries but account for the major part of perinatal and postnatal deaths. Therefore, it becomes essential to identify women who are at risk of preterm delivery early enough so that an optimum treatment like tocolysis or cerclage can be given. One of the earliest indicators of cervical in competence or onset of labour is shortening of the cervix. Other features of the cervix such as funneling (effacement of the internal aspect of the cervix) and shortening in response to fundal pressure are known to be associated with preterm delivery but do not add significant advantages to predictive modelling when compared to accurate measurement of cervical length alone. Cervical length is most accurately measured by transvaginal ultrasound examination.

In our study, the preterm labor was seen in 11.77% of the patients, whereas according to Feresu et al[24] and Tanvir SG et al[14], it is 16.4 % and 12.3 % respectively. In the preterm delivery patients, almost 84.31% of the patients had short cervical length. Similarly in the study conducted by Tanvir SG et al[14] it was seen in 81.3 %. In the full term delivery patients, only 6.54% of the patients had short cervical length. Our study showed sensitivity of 63.2 %, specificity of 97.8%, positive predictive value of 84.3%, and negative predictive value of 93.4%. Almost similar results have been reported in the study conducted by Kore SJ et al[9] with sensitivity of 56.7 %, specificity of 97.6 %, positive predictive value of 89.5%. Similar results were also found in Iams et al[7] and Gomez et al[25] .

Our study shows positive relationship between cervical length and period of gestation at delivery. Hence, there was a strong correlation established between patients with short cervical length who had preterm delivery.

Conclusion:

Predicting spontaneous preterm birth helps in early intervention and improvement in outcome. Ultrasonographic assessment of the cervix is an alternative method to objectively assess cervical length and for prediction of preterm labour. There is a very strong correlation between a short cervix and preterm labor.

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