Cervical Sonography in Preterm Labour

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Summary

This study was done at JNMC Wardha, to assess the diagnostic performance of Ultrasonographic examination of the cervix in prediction of preterm delivery. A cross-sectional study of 60 patients admitted with preterm labour (24-36 weeks) was done. Endovaginal ultrasonography was performed in all the patients. Cervical parameters evaluated were cervical length, cervical dilation, presence of funnelling, bulging of bag of memberanes into cervical canal. Cervical length measurement of <30 mm was associated with significantly increased risk of preterm delivery ($p<0.001$). Presence of funnelling also significantly increased the risk of preterm delivery. ($p<0.001$).

Introduction

The accurate diagnosis of preterm labour remains an elusive goal. Risk assessment of preterm labour becomes difficult particularly in women with no prior history of preterm birth. The best predictor of preterm labour is a poor past reproductive performance which makes it difficult to identify nulliparous patients at risk of preterm delivery. (38% women in our study were primigravida). The impact of preventive measures will be far from optimal if this large group of patients remains undetected. In a large majority of the cases, the onset of preterm labour is a surprise for the obstetrician. It is exceptional however to find a patient with preterm labour, who did not show some indication of the problem several days or weeks before the onset of symptoms. The onset of preterm labour in not a sudden event, but a culmination of many silent uterine and cervical changes. Hence ultrasonography of the cervix can be used to detect these changes and provide early warning of preterm labour. Prediction of preterm labour can be done with the help of :-

1) Digital examination
2) Uterine Contractions monitoring
3) Ultrasonography of the cervix
4) Biochemical Markers.

Digital examination is necessarily subjective. It assesses the vaginal portion of the cervix. Dilatation of the internal os cannot be diagnosed accurately without inserting a finger in the cervix, which in turn can lead to introduction of infection, PROM and can stimulate uterine activity. The diagnosis of preterm labour is a late one when cervical dilatation is more than 2cm and effacement more than 80%. Uterine contractions monitoring has not lived up to the initial optimism as an effective alarm system. Biochemical markers, most widely studied is fetal fibronectin, is not available in all the centres.

USG examination of the cervix, provides an objective and non-invasive method for the assessment of the cervix. This method provides meaningful information about cervical changes as also subtle changes at the internal os. It provides information about associated conditions like placenta praevia, IUGR, congenital anamolies and also the duration of pregnancy, fetal maturity, expected birth weight of the newborn etc. Also ultrasound is a facility that is commonly available not only in large hospitals but also in private clinics in smaller places. USG assessment of the cervix can enable doctors to refer their patients of preterm labour to centres where good premature baby units are available.

AIMS

The diagnosis of preterm labour inplies the ability to – (1) Identify patients at risk of preterm labour before the onset of symptoms. (2) To make the diagnosis after the onset of symptoms. Our study is aimed at identifying the first group of patients. The purpose of this study was to assess the diagnostic performance of ultrasonographic examination of the cervix in prediction of preterm delivery.

Materials & Methods

A cross-sectional study of 60 platients at risk of preterm labour (24-36 weeks) was done.

Inclusion Criteria – Patients enrolled for the study were –

1) Patients presenting with premonitory symptons like - pain in abdomen, vaginal, rectal and perineal pressure and excessive mucoid discharge pv.
2) Patients with previous history of preterm labour.

Exclusion Criteria – 12 patients were excluded from the study. These included-

1) Patients who delivered within 24 hours of admission
2) Patients lost to follow up.
3) Patients with associated conditions like PROM, placenta praevia, previous CS

Of the selected 48 patients, 45 were singleton pregnancies and 3 were twin pregnancies.

Endovaginal ultrasonography of the cervix was performed in all the patients, using 5 MHz probe. Endovaginal USG was preferred over abdominal USG because bladder filling increases apparent cervical length. USG was performed by a single operator with many years of experience in the field, to eliminate the intra-observer variability.

The cervical parameters evaluated were cervical length, cervical dilatation, presence of funnelling, bulging of membranes into cervical canal.

All patients were subjected to gentle speculum examination, to note for vaginitis and leaking (PROM). Pervaginal examination was done in patients showing significant uterine activity (2-3 contraction in 10 mins). Per vaginal examination was avoided in other patients. USG findings did not influence management of patients. Patients were treated by clinical judgement. All patients were treated with tocolytic agent-Isosuxprine hydrochloride-oral, IM or IV as required. All patients were given antenatal corticosteroids for lung maturation.

Results

1. Age – The mean age of the study population was 24 ± 2.33 years.
2. Parity – 18 patients (38%) were primigravida. 30 patients (62%) were multigravida.
3. 42 patients had a spontaneous normal delivery, 1 patient was induced at 36 weeks for preclampsia, 5 patients had caessarean section for indications like breech, BOH and fetal distress.
4. Cervical parameters evaluated were as follows

a. Cervical length – We observed an inverse correlation between cervical length and preterm delivery. The shorter the cervical length, sooner was the delivery ($P<0.001$). As shown in table I, we took C.L. of 30 mm as cut off point. Out of 33 patients with C.L. < 30 mm, 28 patients delivered preterm, 5 patients delivered after 36 weeks. [Sensitivity – 94%, Specificity – 72%, PPV – 85%, NPV – 87%].

Table – I
Cervical length < 30 mm

	No.	%
Sensitivity	28 / 30	93.33
Specificity	13 / 18	72.22
PPV	28 / 33	84.84
NPV	13 / 15	86.66

The mean gestational age at delivery in patients with C.L. < 30mm was 34.5 ± 2.07 weeks. The mean gestational age at delivery in patients with C.L. > 30 mm was 38.2 ± 1.76 weeks, a statistically significant difference $P < 0.05$.

b) Cervical dilatation – as shown in table II is not a very sensitive parameter, for prediction of preterm labour. Cervical dilatation was considered significant when internal OS was dilated > 1 cm. 17 patients had C.D. > 1 cm. out of which 11 delivered preterm, and 6 delivered after 36 weeks, giving a P > 0.005.

Table – II
Cervical dilatation

	No.	%
Sensitivity	11 / 23	47.82
Spcificity	19 / 25	76.00
PPV	11 / 17	64.70
NPV	19 / 31	61.29

c) The presence of funnelling significantly increase the risk of preterm delivery P<0.001. Funnelling was present in 16 patients, out of which only one delivered after 36 weeks. 15 patients delivered preterm as shown in table III.

Table – III
Presence of Funnelling

	No.	%
Sensitivity	15 / 27	55.55
Specificity	20 / 21	95.23
PPV	5 / 16	93.75
NPV	20 / 32	62.50

d) Six patients had bulging of bag of membranes into cervical canal, all of whom delivered preterm.

4) The mean birth weight of the newborn was 2.13 ± 0.5 Kg.
5) The perinatal mortality rate was 125/ 1000 L.B. (6 losses in 48patients.)

Discussion

According to Rizzo 1996 the opportunity for performing USG in patients with suspected PTL should not be missed. Our study offers evidence that sonogrophic measurement of cervical length can identify patients at risk of preterm delivery (Table IV) Anderson et al 1990 were the first to report that ultrasonographic cervical length measurements are inversely related to the risk of preterm delivery. They found that C.L. < 39 mm was associated with significantly increased risk of preterm delivery (25% versus 6.7%) and detected 76% of preterm births. Imas et al 1994 found a C. L. < 30 mm had a sensitivity 100%, NPV 100%, specificity 55%, PPV 55%. There were no births before 36 weeks in women with C.L. > 30 mm by USG.

Presence of cervical dilatation was a parameter not as sensitive as shortened C. L. Presence of funnelling (P<0.001) and bulging of bag of membranes into cervical canal were good predictors of preterm delivery. Ultrasonography also helps in prediction, etiology, diagnosis and assessing prognosis of PTL. It helps to exclude fetal malformations, and hence to decide whether to inhibit PTL or allow delivery.

Conclusion

Ultrasonographic criteria for diagnosis of PTL are pregnancy specific and objective. It provides meaningful imformation about cervical changes, which cannot be detected by digital examination. Hence USG is the single most useful investigation in prediction and management of patients with PTL. Used appropriately it can be a great complement to clinical judgement.

References

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