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Original Research Article

Prediction of meconium stained amniotic liquor in low risk obstetric population by labor admission test

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Abstract: The labor admission test is a very useful screening test in early labor to detect meconium stained liquor or compromised fetus on admission. It is used to select the woman in need of continuous fetal electronic monitoring during labor. It is a dynamic screening test to study fetal oxygenation at the time of admission of mother in labor room. The objective is to assess the reliability of the admission cardio-tocogram in detecting fetal hypoxia due to meconium stained liquor. This study is a hospital based descriptive observational study including 130 low risk women's with complaints of labor pain after applying specific selection and exclusion criteria and compared for fetal status in term of hypoxia due to meconium. Statistical analysis is done using Chi square test and $p<0.05$ is considered as statistically significant. Sensitivity, specificity, positive and negative predictive values, diagnostic accuracy of the admission CTG is also measured. According to statistically analysis there is a significant co-relation between the labor admission test andmeconium stained liquor. We concluded that study is showing high Negative predictive value (94.29%) so this admission test is very useful prognostic tool in detecting compromised fetus very early in first stage of labor and helpful in predicting the fetal outcome and mother's wellbeing.
Keywords: Labor admission test, Meconium stained liquor, Diagnostic accuracy.

INTRODUCTION

Care given to a mother during her pregnancy and childbirth is an index of civilisation. There is a sea change in the antenatal and intranatal care since the inception of the concept of antenatal care by Bellantyne in 1901[1]. While nutritional supplements, vaccinations and investigations as part of antenatal care have increased and improved for better maternal and fetal wellbeing, the ten centimetre journey from brim to the outlet of pelvis has remained the most dangerous journey in one's life since the evolution of the species.

Hence the necessity of monitoring of the fetus, in the antenatal and the intranatal period and hence an insight and research into the modern biomedical engineering and its application to fetal activity.

ADMISSION CARDIOTOCOGRAPHY:

A short recording of fetal heart rate over 20-30 minutes is done immediately after admission in the labor room. In this application of electronic fetal monitoring, women with low risk pregnancies are monitored for a short time on admission for labor, and continuous monitoring for further management is used only if abnormalities of the fetal heart rate patterns are subsequently identified.

Thus: -

- It is a dynamic screening test to detect meconium amniotic fluid at the time of admission of mother in labor room.

AIMS & OBJECTIVES

- To assess the reliability of the admission cardio-tocogram in detecting fetal hypoxia due to meconium stained amniotic fluid in low risk obstetric population.

MATERIAL & METHODS

The present study, a hospital based descriptive observational study was conducted in Department of Obstetrics & Gynaecology, S.M.S. Medical College & attached group of Hospitals, Jaipur from February 2015 to 2017.

After obtaining the institutional ethical committe approval, 130 pregnant women were admitted in the labor room in first stage of labor after applying inclusion (gestational age of ≥ 36 week, Singleton pregnancy, Cephalic presentation, Primi or multi-gravida) & exclusion (Bad obstetric history, Multifetal pregnancy, Congenital fetal anomalies, Mal-presentation, False labor pain, Elective LSCS or previous LSCS, Use of sedative drug, Admission interval > 24 hrs, IUGR, Medical disorders: Hypertension, anaemia, asthma, thyroid disorder etc.) criteria.

After included in the study, the patients were explained about the procedure and informed consent was obtained. The pregnant mother was asked to empty her bladder and all the procedure, what to expect during the procedure and what is expected of her were explained to her. She is placed in the semi fowler's position. The ultrasound transducer is applied to the maternal abdomen with a gel interface and the foetal heart rate is observed for 20 min. The patient is asked to press the event marker every time she perceives foetal movement. Presence of spontaneous foetal heart rate accelerations with foetal movement is an indicator of foetal well-being.

In the present study the observations for an admission CTG were done on following lines - According to NICE guideline [2014], Intrapartum care for healthy women and babies (CG190)[2].

1. Baseline fetal heart rate
2. Baseline variability
3. Decelerations
4. Accelerations

The admission test tracings were typed into (i) Reactive & (ii) Non- Reactive. The admission test was used in comparison of meconium stainedliquor in reactive & non-reactive group of low risk obstetric population.

Table-1: Age Wise Distribution of Study Subjects

Age Group (in yrs)	Number	%
≤ 20	12	9.23
21- 25	49	37.69
26- 30	55	42.31
>30	14	10.77
Total	**130**	**100.00**

This table reveals that most of the study subjects belonged to 21-30 years age (this is most fertile period) group 104 (80%). Only 10.77% of subjects were above 30 years of age & adolescent pregnancy contribute only 12 (9.2%) subjects.

Table-2: Gravidity Wise Distribution of Study Subjects

Gravity	Number	%
Primi	58	44.61
Second	56	43.08
Third	14	10.77
Fourth	2	1.54
Total	**130**	**100.00**

Above table reveals that most of the study subjects were primi gravida (44.61%) and 43.08% were 2nd gravida. Only 16 (12.31%) of women had gravida 3 or more.

RESULTS:

Result of Labor Admission Test :

Out of 130, 105 (80.77%) women had reactive and 25 (19.23%) had non-reactive CTG tracings.

Table-3: Result of Labor Admission Test

	Reactive	Non- Reactive	Total
Result of CTG	105 (80.77%)	25 (19.23%)	130 (100.00%)

Our study shows that labor admission test (LAT) applied on 130 study subject (all belonged to low risk obstetric population) after assessing inclusion & exclusion criteria. Out of 130, CTG was reactive in 105 (80.77%) cases and non-reactive in 25 (19.23%) cases.

Table-4: Colour of Liquor

Colour	Reactive (n = 105)		Non-reactive (n = 25)	
	Number	%	Number	%
Clear	95	90.47	6	24.00
Presence of Meconium	10	9.53	19	76.00
Total	**105**	**100.00**	**25**	**100.00**

$\chi^2 = 50.445$ d.f. = 1 $p < 0.001$ Sig

Present table reveals that in reactive group colour of liquor was clear in 90.47% cases and presence of meconium in liquor was present in 9.53% of cases, where as in non reactive group 76% had presence of meconium in liquor. Whereas 6 (24%) out of 25 had clear liquor in Non-reactive group. Application of Chi-square test showed that non reactive AT is significantly associated with MSL ($p<0.001$).

Table-5: Diagnostic Parameters of Admission Test

Diagnostic Parameters	% (95% CI)
Sensitivity	70% (45.72 – 88.11%)
Specificity	90% (82.81 – 94.90%)
Positive Predictive Value	56% (40.40 – 70.49%)
Negative Predictive Value	94.29% (89.39 – 97%)
False Negative	5.70%
False Positive	44.00%

Above table shows that CTG at admission has high sensitivity and specificity for predicting fetal distress (70 % and 90% respectively). Proportion of false negative results is very low. A high NPV (94.29%) allows a clinician to accurately exclude fetal distressby meconium stained liquor in individual patient.

DISCUSSION

In our study 130 antenatal women were included according to the inclusion criteria 104 out of 130 belonged to 21-30 years age group (this is most fertile period) group 104 (80%). Only 10.77% of subjects were above 30 years of age & adolescent pregnancy was contribute only 12 (9.2%) subjects. Most of the study subjects were primi gravida (44.61%) and 43.08% were 2nd gravida. Only 16 (12.31%) of women had gravida 3 or more.

Our study shows that labor admission test (LAT) applied on 130 study subject (all belonged to low risk obstetric population) after assessing inclusion & exclusion criteria. Out of 130, CTG was reactive in 105 (80.77%) cases and non-reactive in 25 (19.23%) cases.

Similarly Rahman H et al (2012)[8] conducted a study on 192 pregnant woman and showed that CTG was Reactive in 88.40% and Non reactive in 12.0% woman.

Dwarakanath L et al (2013)[9] conducted a study on 200 pregnant women, and showed that Incidence of reactive trace was 69% & Non-Reactive 31%.

While in a study conducted by Chuang J et al(2004)[5] on 169 patients, only 11 (6.5%) showed fetal heart-rate deceleration.

Talaulikar VS et al (2011)[7]showed, the test was reactive in 94.3% out of 1041 patients.

This table(4) showed that we can identified most of the fetus compromised due to meconium stained

liquor at the time of admission by LAT and accordingly manage them.

Similarly Hafizur Rahman et al (2012)[8] conducted a study on 192 pregnant women, Incidence of moderate to thick meconium stained liquor was significantly high in ominous (66.7%) and equivocal group (18.2%), as compared to reactive group (2.4%).

Blessy D et al (2014)[10] conducted a study on 400 patients, about 72% patients with an ominous test had moderate-thick MSL, compared to 39% and 9% in the equivocal and reactive AT group respectively ($p<0.001$).

While in a study conducted by Liu W et al (2001)[4]on 262 cases, during intra partum there was no significant relationship between baseline and variability of CTG with the quality and colour of amniotic fluid.

Khursheed F et al (2009)[6] conducted a study on 210 women,Meconium stained liquor was present in 23 (15.97%) babies of reactive group & 18 (27.27%) babies of non reactive group.

Hafizur Rahman et al (2012)[8] conducted a study on 192 patients, has a sensitivity of 73.7%, specificity of 94.8%, positive predictive value of 60.9%, and negative predictive value of 97.0%.

Dwarakanath L et al (2013)[9] was conducted a study on 200 pregnant women, this study has a sensitivity of 76% and positive predictive value (PPV) of 96%, specificity of 77% and negative predictive value (NPV) of 33% for a reactive test.

Blessy David et al (2014)[10] was conducted a study on 400 patients. The study concluded that admission CTG has 92.85% sensitivity and 94.16% specificity. The positive predictive value was 87.96% and negative predictive value was 96.62% with a diagnostic accuracy of 93.75% indicating that reactive admission CTG correlates well with the fetal wellbeing.

CONCLUSION

The cardiotocography test is a simple, non-invasive, inexpensive test for detecting fetal hypoxia due to meconium stained liquor. It is easy to perform and causing no inconvenience or complications to the patient. CTG test should be performed for diagnostic performance in light of clinical circumstances.

Our study has shown that Non-Reactive CTG is an alarming sign for active intervention as early as at the time of admission because those who have Non-Reactive CTG (approximately 20% [25 cases] in our study) majority of them have fetal distress. Hence early intervention decreased the neonatal morbidity.

Now we have automated machine available for recording of cardiotocogram, more of training is not required to interpretate the CTG results, hence we recommends availability in every labor room both in public sector (i.e. District Hospitals, Sub District Hospitals, Community Health Centre and even in Primary Health Centre) and private sectors.

Study showing high Negative predictive value (94.29%) so this admission test very useful in detecting compromised fetus, in very early in first stage labor.

Finally conclude that admission test is a very useful prognostic tool in early labor for triaging of fetus and helpful in predicting the fetal outcome and mother's wellbeing.

REFERENCES

1. Reiss HE. Historical insights: John William Ballantyne 1861-1923. Hum Reprod Update, 1999 Jul-Aug; 5(4) : 386-9.
2. NICE guideline [2014], Intrapartum care for healthy women and babies (CG190), Published: 3 December 2014, nice.org.uk/guidance/cg190.
3. Nguyen T, Larsen T, Engholm G, Møller H. *Evaluation of ultrasound-estimated date of delivery. Ultrasound Obstet Gynecol, 1999 Jul; 14(1) : 23–8.*
4. Liu W, Li X, Tang D. Conducted study of relationship between computerised cardiotocography and perinatal outcomes. Zhonghua Fu Chan Ke Za Zhi, 2001 Oct; 36(10) : 581-4.
5. Chuang J, Chou CT, Cheng WC, Huang LW, Hwang JL, Tsai YL. Spontaneous FHR deceleration : an ominous sign for fetal outcome. Arch Gynecol Obstet, 2004 May; 269(9) : 254-8.
6. Khursheed F, Chandra MD, Jatoi N.Cardiotocography : Obstetric and Neonatal outcome. Journal of Rawalpindi Medical College (JRMC), 2009; 13(2) : 86-88.
7. Talaulikar VS, Arulkumaran S. Labor Admission Test.International Journal of Infertility and Fetal Medicine, September 2011; Vol. 2, No. 3 : 89-95.
8. Dr. Hafizur Rahman, Dr. Renjhen Prachi, Dr. Dutta Sudip, Reliability of admission cardiotocography in predicting adverse perinatal outcome in low risk obstetric population, Indian Obstetrics & Gynaecology, Oct.-dec. 2012; 6-10.

9. Dwarakanath L, Lakshmikantha G, Chaitra SK. Efficacy of admission cardiotocography (admission test) to predict obstetric outcome. Journal of Evolution of Medical and Dental Sciences, February 2013; 2(5) : 66.
10. Blessy D and K Saraswathi. A study on role of admission CTG as a screening test to predict fetal outcome. Research Journal of Pharmaceutical, Biological and Chemical Sciences Department of Obstetrics and Gynaecology, 2014, 5(6): 295.