Publisher
MEDRESEARCH
www.medresearch.in

Obs Gyne Review - Journal of Obstetric and Gynecology

2025 Volume 11 Number 1 Jan-Dec

E-ISSN:2455-5444
P-ISSN:2581-4389
RNI:MPENG/2017/74037

Research Article

Cardiotocographic evaluation

Cardiotocographic evaluation of fetal condition and outcome in pregnant women presenting with less foetal movement beyond 34 weeks

Zahan N[1*], Hossain SN[2], Akter T[3], Bushra A[4], Khanam A[5], Dina US[6], Minkin T[7]

DOI:https://doi.org/10.17511/joog.2025.i01.01

[1*] Nusrat Zahan, Emergency Medical Officer, Upazila Health Complex, Lohagara, Chattogram, Bangladesh.
[2] Syeda Najiba Hossain, Indoor Medical Officer, Department of Obstetrics and Gynaecology, Dhaka Medical College and Hospital, Dhaka, Bangladesh.
[3] Tasmia Akter, MBBS FCPS MCPS DGO, Obstetrics and Gynaecology, Gynaecologist CMH, Chittagong, Bangladesh.
[4] Anika Bushra, Registrar, Department of Obstetrics and Gynaecology, BRB Hospital, Dhaka, Bangladesh.
[5] Afroja Khanam, Assistant Registrar, Department of Obstetrics and Gynaecology, Cumilla Medical College Hospital, Cumilla, Bangladesh.
[6] Umme Salma Dina, Registrar, Department of Obstetrics and Gynaecology, Mymensingh Medical College Hospital, Mymensingh, Bangladesh.
[7] Tanmina Minkin, Consultant, Department of Obstetrics and Gynaecology, Popular Diagnostic Centre LTD, Kushtia, Bangladesh.

Introduction: Cardiotocography (CTG) is widely used to identify pregnancies that might be benefited from continuous fetal monitoring in labour or during antepartum states. So the objective of the present study is to observe the fetal condition and outcome in pregnant women presenting with less foetal movement beyond 34 weeks.

Methods: For that 50 cases of pregnant women beyond 34 weeks presenting with less fetal movement were included and CTG was done. They were observed till delivery and the APGAR score of the neonate was collected at 1st minute and 5th minute. When CTG was found reactive before 37 weeks they were managed conservatively and again examined at 37 weeks. When CTG was found nonreactive after 37 weeks, they were reevaluated after 30 minutes and the decision was taken. Data were correlated and analyzed by SPSS 20.

Results: Different sociodemographic profiles where the majority of women were in the age group 21-25 years, working as housewives, nonsmokers and found to be from rural areas with lower and lower-middle-class status. The average gestational age was found 38 weeks, and the mean height of the uterus was 36 cm. Maximum patients were primigravida and with no medical illness. 100% of patients were presented with vertex presentation. Cardiotocographic findings revealed baseline fetal heart rate was found 110 to 160 bpm in 34(68%) cases and < 110, > 160 bpm found in 16(32%) cases. Also, baseline variability, acceleration and decelerations were found. Among 50 cases 34(68%) had normal vaginal delivery and 16(32%) cases undergone CS. Neonatal outcome revealed live birth was 50(100%), <5 APGAR score was found in 5(10%), 5(10%) cases required neonatal resuscitation, 5(10%) needed NICU admission. No seizures within 24-48 hours and no cases of perinatal death.

Conclusion: Cardiotocography is an important tool to assess the fetal condition in pregnancy.

Keywords: Cardiotocography, Less Fetal Movement, Pregnant Women

Corresponding Author

Nusrat Zahan, Emergency Medical Officer, , Upazila Health Complex, Lohagara, Chattogram, Bangladesh.
Email: pinkshopno@gmail.com

How to Cite this Article

Zahan N, Hossain SN, Akter T, Bushra A, Khanam A, Dina US, Minkin T, Cardiotocographic evaluation of fetal condition and outcome in pregnant women presenting with less foetal movement beyond 34 weeks. Obs Gyne Review J Obstet Gynecol. 2025;11(1):1-5.
Available From
https://obstetrics.medresearch.in/index.php/joog/article/view/177

To Browse

Manuscript Received	Review Round 1	Review Round 2	Review Round 3	Accepted
2024-12-17	2024-12-24	2024-12-31	2025-01-07	2025-01-14

Conflict of Interest	Funding	Ethical Approval	Plagiarism X-checker	Note
None	Nil	Yes	12.36	

Introduction

Cardiotocography was incorporated into clinical obstetrics to reduce both antepartum and intrapartum mortality and morbidity. Antipartum and intrapartum monitoring has improved fetal outcome and normal survival is now possible in cases considered hopeless years ago. The enduring challenge of the obstetrician lies in the need to care for two patients simultaneously, one the mother who can express her problems and the other the fetus who is hidden from our view and unable to express the same. The primary goal of antenatal evaluation is to identify fetuses at risk for intrauterine injury and death so that intervention and timely delivery can prevent progression to stillbirth or neonatal death. Ideally, antenatal tests would decrease fetal death. Not all mothers or babies are blessed with trouble-free gestation.[1] [2]

Cardiotocography (CTG) is continuous electronic monitoring of the fetal heart rate along with a recording of fetal movements. It is a non-invasive procedure which can help us assess the fetal condition. The Cardiotocography derives from the seminal report that accelerations are a reliable sign of fetal well-being [3]. Prolonged second stage of labour and repeated late deceleration on CTG tracings in low-risk populations were predictors of APGAR scores at 5min of<7, a situation that was strongly associated with increased risk of neonatal respiratory distress and need for mechanical

Ventilator support and NICU. In addition APGAR at 5min <7 was strongly associated with Hypoxic ischemic encephalopathy and consequently cerebral palsy.[4] Nonreassuring fetal heart rate (FHR) patterns or categories of the three tire interpretation systems of FHR, based on the National Institute of Child Health and Human Development (NICHD) workshop suggestion on electronic monitoring of FHR include bradycardia, tachycardia, lack of acceleration, lack of variability and periodic or episodic deceleration (recurrent variable deceleration, prolong deceleration, and late deceleration with baseline variability).[5] [6] Cardiotocography (CTG) is known as a tool to assess the fetus during labor.[7] Studies have shown that asphyxia and hypoxic-ischemic encephalopathy (HIE) in 79% of cases were associated with an abnormal CTG. [7]

Researchers, in studying healthy pregnant women during labour with continuous CTG and fetal pulse oximetry concluded that a significant association exists between short-term variability in CTG and fetal blood oxygen saturation in second stage of labour. Fetal pulse oximetry in assessment of fetal health can be valuable especially when results of CTG are abnormal.[8]A high percentage of cesarean deliveries are due to fetal distress (based on CTG), and identifying status of fetus using pH measurement of fetal scalp blood in cases of abnormal CTG is required and this is currently not possible for our patients. Also, if we do CTG in antepartum states and find some abnormalities we can do intervention and can avoid fetal loss. So this study investigates relationship between nonreassuring patterns in CTG and birth asphyxia to understand cases of nonreassuring fetal heart patterns and emergency termination of pregnancy due to concerns about condition of fetus and to what extent these changes were related to birth asphyxia.

Materials and Methods

Study design: Hospital-based observational study.

Place of study: Department of Gynae and Obs, BBMH, Chittagong, Bangladesh.

Period of study: Six months (4th August 2018 to 3rd February 2019).

Study populations: All pregnant women beyond 34 weeks, singleton pregnant women, with the cephalic presentation with less fetal movement.

Sample size: The proportion of patients with joint involvement is unknown in our setting. So the following formula is used to calculate the sample size, Due to time and resource constrain 50 cases of pregnant women will be taken.

Inclusion and Exclusion criteria.

Inclusion Criteria:

1. All pregnancies with less foetal movement beyond 34 weeks.

Exclusion Criteria:

1. Other indications of cesarean section like cephalopelvic disproportion
2. Previous history of CS

3. Severe intrapartum hemorrhage
4. Comorbidities like DM.HTN.HF, CKD etc

The procedure of preparing and organizing materials: The selection of cases according to inclusion and exclusion criteria and findings of observation were recorded on the prescribed data collection form.

Types of equipment to be used: CTG machine, standard ruler, monitor, and data collection sheet.

Procedure of data analysis of interpretation: After collection, data was edited, and analyzed on a computer by using SPSS version 20 software.

Quality assurance strategy: All efforts were made to reduce likelihood of important errors which compromise essential integrity of research data. For that purpose, at first, a sample size was selected. Then manual work was done. An easily understandable questionnaire was presented to respondents so that they were able to understand questions easily and answer accordingly.

Results

Table 1: Sociodemographic features

		Frequency	Percent
Age group	<20 years	6	12.0
	21-25 years	20	40.0
	26-30 years	17	34.0
	31-35 years	7	14.0
Occupation	Housewife	34	68.0
	Service holder	11	22.0
	Student	5	10.0
Locality	Rural	16	32.0
	Urban	34	68.0
Socioeconomic status	Lower class	14	28.0
	Lower middle class	30	60.0
	Upper middle class	6	12.0
	Total	50	100.0

Table-1 showing different sociodemographic profiles where the majority of women were in the age group 21-25 years, working as housewives and found to be from urban areas with lower-middle-class status.

Table 2: Descriptive variables

	N	Minimum	Maximum	Mean	Std.Deviation
Para	50	1	4		
Gravida		1st	5th		
Gestational age(weeks)		35	41	38	2.32
Height of Uterus		32	40	36	4.145

Table 2 shows different descriptive variables where the average gestational age was found 38 weeks, and the mean height of the uterus was 36 cm.

Table 3: Gestational age and Doppler Velocimetry (15 cases)

Range of GA (weeks)	Frequency
34-36	15
37-40	25
> 40	10
Result	Frequency
Normal flow pattern	13
Abnormal flow pattern	2

Table 3 showing maximum patient is in the range of 37 to 40 weeks. Table showing doppler velocimetry result (S/D, RI, PI in UtA, MCA, Umbilical Artery) in 15 preterm cases.

Table 4: Presentation

	Frequency	Percent
Vertex	50	100
Total	50	100.0

Table 5: CTG findings

Interpretation	Findings	Frequency	Percent
NORMAL (Reassuring)	Baseline FHR 110-160 Accelerations (Present) Decelerations (Absent) Baseline variability (Present)	34	68%
ABNORMAL (No reassuring)	Baseline FHR <110,>160 Accelerations (Absent) Decelerations (Present) Baseline variability (Absent)	16	32%

Table-5 showing different cardiotocographic findings.

Table 6: Mode of delivery and Type of delivery

Type	Number	Percent
NVD	34	68
CS	16	32
Type	Number	Percent
Natural	24	48
Induced	26	52

Among 50 cases 34(68%) had normal vaginal delivery and 16(32%) cases undergone CS. Among 50 cases 24(48%) were natural and 26(52%) cases were induced (table-6).

Table-7 showing neonatal outcome where live birth was 50(100%), <5 APGAR score was found in 5(10%), 5(10%) cases required neonatal resuscitation, 5(10%)needed NICU admission.

No seizures within 24-48 hours and no cases of perinatal death.

Table 7: Outcome of the fetus

Variables	Frequency	Percentages
Alive baby	50	100%
APGAR score of baby <5	5	10%
Neonatal Resuscitation required	5	10%
NICU admission:	5	10%
Neonatal seizure within the first 24-48 hours:	0	0%
Perinatal death:	0	0%

Discussion

Cardiotocography is a simple, safe, non-invasive and economical investigation which can be done on every patient in labour. This test should be a part of antepartum and intrapartum fetal surveillance conducted on every patient as a part of admission. The abnormal patterns are recognized and necessary and timely intervention is done, thereby saving mother and fetus. Admission cardiotocography is widely used to identify pregnancies that might benefit from continuous fetal monitoring in labour. A study of antenatal CTG in Nigeria concluded that the non-reactive CTG was a valuable tool for early detection of fetal compromise.[9] It had a modest predictive value for soft outcomes such as mild asphyxia, a diagnosis of fetal distress, and operative delivery, particularly in the next few hours.[10] Different sociodemographic profiles where the majority of women were in the age group 21-25 years, working as housewives and found to be from rural areas with lower and lower-middle-class status. These are some common demographic findings that are expected from the context of Bangladesh. Different descriptive variables where the average gestational age was 38 weeks and the mean height of the uterus was 36 cm. Among all 50 (100%) Patients were presented with vertex presentation. Different cardiotocographic findings were normal was found in 34 (68%) cases. Abnormal was found in 16 (32%) cases.Among 50 cases 34(68%) had normal vaginal delivery and 16(32%) cases undergone CS.Among 34 cases with reassuring CTG findings, 13 cases were preterm (34 to 36 weeks), 17 cases were term (37 to 40 weeks) and 4 cases were postdated (more than 40 weeks). Preterm cases were managed conservatively and delivered at term.

Among 16 cases with nonreassuring CTG findings were managed with non-surgical management (i.e. change of posture, O2 inhalation, hydration etc.) initially. Then again CTG was done after 30 minutes. When CTG was found persistently nonreassuring they were terminated by LSCS. In 15 preterm cases, doppler velocimetry was done along with CTG.

Among them, 2 cases were found nonreassuring CTG with abnormal flow pattern in Doppler velocimetry (elevated S/D, RI, PI and reduced EDV in Umbilical Artery) and were terminated by LSCS. The neonates of these 2 cases were found severely asphyxiated and needed NICU admission. Regarding neonatal outcome number of live births was 50(100%), <5 APGAR score was found in 5(10%), 5(10%) cases required neonatal resuscitation, 5(10%) needed NICU admission, no seizures within 24-48 hours and no cases of perinatal death.

Conclusion

This study concluded that reassuring fetal heart rate patterns or reactive cardiotocography is a reliable indicator of fetal well-being in pregnant women with less fetal movement. Reduced fetal movement in the third trimester and abnormal pregnancy outcomes were more common when initial cardiotocography was abnormal or persistently non-reassuring.

Limitations

The study population was selected from one selected hospital in Chittagong City, so the results of the study may not reflect the exact picture of the country.
The present study was conducted in a very short period with limited funds.
The sample size was limited. If the study could be done in a large group of people then the results of the study would be more producible.

Recommendations

Further studies can be undertaken by including the large number of patients.
The multicenter large-scale study should be done to assess the national condition

Conflict of Interest: None.
Source of Fund: Nil.

References

1. Daly N, Brennan D, Foley M. Cardiotocography As A Predictor Of Fetal Outcome In Women Presenting With Reduced Fetal Movement,. Obstet Gynecol Reprod. Biol, 2011;159(1): 57-61. *[Crossref] [PubMed][Google Scholar]*

2. Amnon Hader, Eyal Sheiner. Abnormal Fetal Heart Rate Pattern During First Stage OfLabour And Effect On Perinatal Outcome. American Journal of Obstetrics And Gynecology. 2001;185(4):863-868, october 2001. *[Crossref][PubMed][Google Scholar]*

3. Odomgo BE, Ndavi PM. Cardiotocography And Perinatal Outcome In Women With And Without Meconium Stained Liquour. East Afr Med J. 2010;87(5):199-204. *[Crossref][PubMed][Google Scholar]*

4. Eugenia Maria. Low APGAR Score At 5 Minutes In A Low Risk Population; Maternal And Obstetrics Factors And Perinatal Outcome, Rev Assoc. Med Bras. 2012; 58:12- 19. *[Crossref][PubMed][Google Scholar]*

5. Eugene Bailey. Intrapartum Fetal Monitoring. Am Fam Physician 2009;15;80 (12). 1388-1396. *[Crossref][PubMed][Google Scholar]*

6. Alfirevic Z, Devane D, Gyte GM. Continuous CTG As A Form Of Electronic Fetal Monitoring For Fetal Assessment During Labour. Conhrane Database of Systematic Review 2006. 3:54-56. *[Crossref] [PubMed][Google Scholar]*

7. Low JA, Pickersgill H. Prediction And Prevention Of Intrapartum Fetal Asphyxia In Term Pregnancies,. American. Medica Journal,. *Obstet Gynecol. 2001;184(4): 724- 730 [Crossref] [PubMed][Google Scholar]*

8. Rozen A, Sheiner E. Abnormal Fetal Heart Rate Trecings And Congenital Fetal Hypothyroidism. Int J. Fertil Womens Med 2008;51(6): 267-269. *[Crossref] [PubMed][Google Scholar]*

9. Fawole AO, Sotiloye OS, Oladimeji AO, Alao MO, Hunyinbo KI, Sadoh EA, Otolorin EO. Antenatal cardiotocography: experience in a Nigerian tertiary hospital. Nigerian Postgraduate Medical Journal 2008; 15:19-23. . *[Crossref][PubMed][Google Scholar]*

10. Mires G, Williams F, Howie P. Randomised controlled trial of cardiotocography versus Doppler auscultation of the fetal heart at admission in labour in low-risk obstetric population. BMJ 2001; 322: 1457–62. . *[Crossref][PubMed][Google Scholar]*