Section: Obstetrics & Gynecology

Original Research Article

STUDY OF ANTEPARTUM AND INTRAPARTUM CARDIOTOCOGRAPHY AND FETAL OUTCOME IN HIGH RISK PREGNANCY

M.Sofia Sowjanya[1], Dhanireddy Salini Shakuntala[2], Y.Lakshmi Priya,[3]B.Neelima[4]

[1-3]Assistant Professor, Department of Obstetrics & Gynecology, Government Medical College, Kadapa, Andhra Pradesh, India.
[4].Associate Professor, Department of Obstetrics & Gynecology, Government Medical College, Kadapa, Andhra Pradesh, India.

Received *: 09/05/2024*
Received in revised form *: 02/07/2024*
Accepted *: 17/07/2024*

Corresponding Author:
Dr. B. Neelima,
Associate Professor, Department of Obstetrics & Gynecology, Government Medical College, kadapa, Andhra Pradesh, India.
Email: budideti77@gmail.com

DOI: 10.70034/ijmedph.2024.3.24

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2024; 14 (3); 137-141

ABSTRACT

Background: High risk pregnancy is one which is complicated by risk factor that adversely affects the maternal outcome or perintal outcome or both. The antepartum fetal surveillance of high risk pregnancies with Cardiotocographycan effectively help for reducing perintal mortality and morbidity. One of the biophysical methods which is being used extensively in the management of high risk pregnancy is (CTG) Cardiotocography. **Aims & Objectives:** 1. To assess the benefit of cardiotocography to improve the fetal outcome in high risk pregnancy. 2. To find out the suitable time and mode of delivery of the fetus at risk.

Materials and Methods: This is a prospective observational study conducted at Government General Hospital attached to Government Medical College, Kadapa from the month of July 2023 to the month of june 2024. Study includes 100 high risk pregnancies with singleton fetus of 32 weeks or more than 32 weeks of gestation CTG performed within 3 days prior to delivery will be considered for fetal outcome. In all cases detailed history, clinical and obstetric examination USG and alntepartum, intrapartum CTG will be performed and decision for mode of delivary is planned and different Perinatal outcome are assessed as 1 min and 5 min apgar score and NICU admissions.

Results: Among 100 high risk pregnancies included in the study the most common risk factor is preeclampsia (25%) followed by oligos (16%). The incidence of non-reactive intrapartum CTG are 33 in number (33%). Out of 100, 43 underwent cesarean section, 54 delivered vaginally and 3 delivered instrumentally. Out of 100 cases one minute apgar was 5-7 in 41 subjects, 8-10 in 58 subjects and <4 in 1 subject. Among the study group 30 (30%) had NICU admissions.

Conclusion: CTG is simple, cheap, non invasive cost effective with less training & best screening test to identity patients at a greater risk of intrapartum fetal hypoxia. CTG is effective tool to evaluate fetal condition, to detect fetal distress and there by early intervention to improve the Perinatal outcome.

Keywords: Cardiotocography, High risk pregnancies, Perinatal outcome.

INTRODUCTION

Many new techniques of Antepartum fetal surveillance were invented, which have been contributed to a striking reduction in the perinatal mortality and morbidity. One of the biophysical method which is being used extensively in the management of high risk pregnancies is Cardiotocography [CTG].High risk pregnancy is one which is complicated by risk factor that adversely affects the maternal outcome or perinatal outcome or both.[1]

The wide spread use of electronic fetal monitoring has been associated with substantial fall in perinatal mortality being 0.7/1000 compared with 1.8/1000 in auscultation group.[2]Abnormal cardiotocography traces is commonly seen in meconium aspiration syndrome.[3]The abnormal cardiotocography pattern

incidence were 2-3 times common in babies who developed cerebral palsy and 6-7 times common in perinatal death.[4]However there is inter observer variations in the interpretation of cardiotocography readings and recommendations for interventions.[5] This study will help to detect fetal distress in the early stages and this helps in preventing the poor fetal outcome.

The Antepartum fetal surveillance of high risk pregnancies with cardiotocography can effectively help for identification of fetuses at high risk and segregate the population that are at risk for perinatal mortality and morbidity. The potential benefit of cardiotocography is decrease in decision to delivery time for those patients with fetal distress.

Cardiotocography is easily available, inexpensive, noninvasive method to monitor the high risk pregnancy. It is an investigation that is easily reproduced, as and when required. We have SNCU in GGH,Kadapa to take care newborn. This study definitely place an important role in reducing perinatal mortality and morbidity in GGH, Kadapa.

Aims & Objectives

1. To assess the benefit of cardiotocography to improve the fetal outcome in high risk pregnancy.
2. To find out the suitable time and mode of delivery of the fetus at risk.
3. To improve the fetal outcome in abnormal antepartum and intrapartumcardiotocography findings.

MATERIAL AND METHODS

This is a prospective observational study conducted at Government General Hospital attached to Government Medical College, Kadapa. Women with high risk pregnancies will be randomly enrolled in to the study and followed up with cardiotocography. After taking approval from institutional Ethics committee, study includes total of 100 high risk pregnancies from time period July2023 to June 2024 i.e. for 12 months. In all cases a detailed history, clinical and obstetric examination will be performed. All preliminary investigation required including USG and antepartum and intrapartum cardiotocography will be then followed up for the mode of delivery and different perinatal outcomes such as perinatal mortality and morbidity, fetal distress, 1 min and 5 min apgar score and NICU admissions.

Inclusion Criteria

1. Singleton pregnancies of 32 weeks or more than 32 weeks of gestation only cardiotocography performed 3 days prior to delivery will be considered for their fetal outcome.
2. Patients with severe anemia or chronic HTN or DM, or oligohydramnios or preeclampsia or BOH or postdated pregnancy or Rhisoimmunization or PROM or IUGR or decreased fetal movements or advanced material age >35 years will be included in the study.

Exclusion Criteria

1. Gestational age <32 weeks.
2. Normal pregnancies
3. Fetal congenital anamolies
4. Multiple gestation.

RESULTS

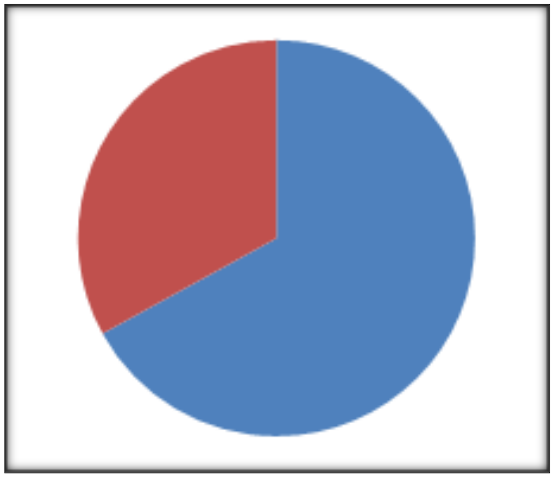
According to age group, most of the subjects are in the age group of 21-25y i.e. 45 subjects,36 in the age group of 26 – 30,12 In the age of 18 - 20 and 7 in between 31 – 45.

Out of hundred high risk pregnancies, 17 cases had <37 weeks gestational age, 69 between 37 to 40 weeks gestation, 14 cases crossed more than 40 weeks gestation.

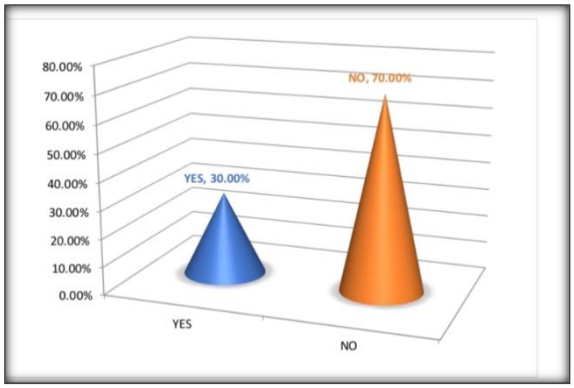
Among hundred high risk pregnancies 39 cases are primigravida 61 cases are multigravida.

Among 100 high risk pregnancies included in study the most common risk factor ispreeclampsia (25%) followed by oligohydramnios(16%).

Of the study group antepartum cardiotocography Done, 82 subjects had reactive and 18 subject had non-reactive cardiotocography, [Table 1]



Graph 1: Intrapartumcardiotocography results



Graph 2. NICU Admissions

Of 100 study group intrapartumcardiotocography done 67 had reactive cardiotocography and 33 had Non-reactive cardiotocography.

Mode of deliveries

Out of 100 subjects,43 had underwent cesarean section and 54 deliveries vaginally and 3 delivered instrumentally.

Of the study group, indications of caesarean section were; 2 antepartum hemorrhage, 4 failed inductions, 6 failed progression, 11 fetal distress, 1 macrosomia, 14 non reactivecardiotocography,2 on maternall demand, 3 oligohydramnios. [Table 2]

Out of 67 Reactive CTG, 12 had underwent LSCS,52 had normal vaginal delivery and 3 delivered instrumentally.Out of 33 Non-Reactive CTG,31 had LSCS,2 had normal vaginal delivery. [Table 3]

Of the study group one minute apgar<4 in one subject, whereas Apgar 5-7 in 41 subjects,8-10 in 58 subjects. [Table 4]

Out of 100 cases apgar at 5 minutes were,5-7 in 3 cases and 97 cases had good apgar score of 8-10.

Out of hundred high risk cases, 11 casespretem,88 term and 1 post term. [Table 5]

Among 100 study group 30 new borns needed NICU admissions. Among the study group, 8 babies had neonatal complications. Of those,2 had HIE(Hypoxic ischemic encephalopathy),4 had MAS(Meconium Aspiration Syndrome), 2 had NEC(Necrotising enterocolitis).

Table 1: Distribution of risk in high risk group

	Frequency	Percentage
Anaemia	5	5.0
BOH	3	3.0
chronic HTN	2	2.0
Decreased FM	4	4.0
Elderly Gravida	3	3.0
GDM	5	5.0
IVGR	8	8.0
Mild preeclampsia	18	18.0
Severe preeclampsia	7	7.0
Oligo	16	16.0
Past dates	13	13.0
PROM	6	6.0
Rh –ve pregnancy	10	10.0
Total	**100**	**100.0**

Table 2: Mode of delivery

Mode of deliveries	Frequency	Percentage
LSCS	43	43.0
NVD	54	54.0
Instrumental	3	3.0
Total	100	100.0

Table 3: Association between intrapartum cardiotocography and mode of delivery

	Intrapartum			Total
LSCS		Reactive	Non-Reactive	
	Count	12	31	43
	%	17.9%	25.1%	43.0%
NVD	Count	52	2	54
	%	77.6%	6.1%	
Instrumental	Count	3	0	3
	%			
	Count	67	33	100
	%	100.0%	100.0%	100.0%

Table 4: Apgar at one minute

Apgar score	Frequency	Percentage
0-4	1	1.0
5-7	41	41.0
8-10	58	58.0
Total	100	100.0

Table 5: Apgar at 5 minutes

Apgar score	Frequency	Percentage
5-7	3	3.0
8-10	97	97.0
Total	100	100.0

DISCUSSION

In the department of OBG Govt medical college, Kadapa, current study was conducted on 100 high risk Pregnancies to access the benefit of cardiotocography to improve the fetal outcome in high risk pregnancy.

CTG is a common type of assessment to identify risk factors in pregnant women. Labour is stressful process and changes observed on the CTG trace may reflect the fetal response. There is a need of continuous electronic fetal monitoring in fetus which is considered to be at a high risk of sustaining intrapartum hypoxic injury.

A reactive CTG is are liable indicator of fetal wellbeing in term fetus.CTG is considered as an ideal procedure that can be used in areas where there will be low resources that screen antenatal cases and early intervention measures to minimize the perinatal morbidity.

Now-a-days CTG has becoming a popular method of monitoring fetal wellbeing and assisting in making decision regarding the decision for the appropriate mode of delivery to improve perinatal outcome.

The current study has been done to determine the incidence of abnormal CTG and thereby correlating its sensitivity and specificity. The prognostic value of the test was assured in terms of incidence of fetal outcome either normal or abnormal. The study showed the positive predictive Value of the test, it indicates its reliability as a diagnostic test. The main aim of antepartum fetal surveillance is to identify fetal distress and there by early intervention and prevention of fetal death.Of the study group, a total of 100 high risk cases weretaken and they are subjected toantepartum and intrapartum cardiotocography monitoring to find out the well being of fetus. Of the study group, in most of the cases antepartum CTG done 2-3 days before the delivery and the case were followed up and intrapartum CTG monitoring done.

In the current study, out of 100 enrolled subjects belong to the age group of 21-25 years (45%) followed by 26-30 years age group (36%).It was correlated with the study byHafizur Rahman et al,[6] in which 42.5% of the subjects were in 21-25 years age group and in the study by kansal et al,[7] majority of patients belonged to 26-30 years age group (44%).

In the current study, risk factor like GDM, IUGR, preeclampisia was compared with a study done by swati et al,[8] which had percentage of GDM, IUGR, and preeclampisia 43.10%, 3.9%,9.80% respectively. Present study has GDM, IUGR, preeclampisia 5.0%,8.0%& 25.0% respectively.

The current study lists out the risk factors that help in identifying the high risk group. In a study done by Manishgupt et al,[9] the commonest risk factor was preeclampisia i.e. 34.80% which has been significantly correlated with the current study as the most common risk factor is preeclampisia 25.0%.The percentage of other risk factors of the present study that are significantly correlated with Manish et al,[9] are oligohydramnios post datism, IUGR, anemia, GDM,Rh-ve pregnancy. Among the study group out of 100, CTG was categorized as reactive and non-reactive among the high risk group. The current study showed antipartum CTG reactive in 82%, and non-reactive in 18%.Of the study group, the percentage value of antepartum CTG for the high risk group showed 82% reactive and 18% non-reactive which is correlated with the study done by swati et al,[8] the percentage values as 88.20%for reactive antepartum CTG and 11.80% for non-reactive CTG. Studies done by sarita et al,R Kansal et al,kunti et al, had values of 76.69% and 23.3%, 92.60% and 7.40%,35 % and 65% for the reactive and non-reactive groups.

Among 100 high risk subjects enrolling current study, it was found that 11.0% had intrapartum fetal distress which was compared to 33.60% In a study by Swati et,[8] and 28.10%,30.40% in the study by Surya Prabha et al[58] and jipmer[58] respectively.In the current study the induction for cases was compared with the Swati et al. The failed induction in the present study is 4% while the studiesdone by swati et al and prabha et al indicates 8% and 24.30% respectively.

Of the current study apgar score at 5 minute for high risk group is 3.0% and it is correlated to study done by swati et al, kansal et alpanda et al,laman et al shows apgar at 5 min as 29.40%, 5.60%,7.48%,40%, respectively.

The NICU admission in the current study is 19.60%. A comparision with the studies done by laman et al, and shresta et al shows these values at 51.40% and 23.10% respectively

CONCLUSION

CTG is simple cheap non invasine,easily repeated & cost effective screening test which needs less training & low maintenance.

Admission CTG is an effective and best screening test to identity patients at a greater risk of intrapartum fetal hypoxia

Reactive CTG is rearranging & indicates fetal wellbeing, but non-reactive CTG alone cannot be taken as a indicator of fetal jeopardy.

The mean Apgar score & hospital stay for the babies with reactive CTG is less whereas the babies with non-reactive CTG has longer stay in NICU. Therefore it has concluded that CTG is effective tool in early detection of pre-existing fetal ditress-

Conflict of interest -None

Source of support -Nil.

REFERENCES

1. Oneill E, Thorp J. Antepartum evaluation of the fetus and fetal wellbeing. Clinical obstetrics and gynaecology. 2012 Sep. 55(3): 722.

2. Atanassov B, lgnatov P. Quantittative cardiotocogrpahy. Akush Gynaecol. 2008; 47:11-5.
3. Ash AK. Managing patients with meconium stained amniotic fluid hosp med 2002, 161: 325-31.
4. Danietian P, Steer P.J. Fetal distress in labour, High risk pregnancy management option, 3rd ed New Delhi; Elsevier 2006 p 450-72.
5. Palomaki O. Luukkaala T, Luoto R, Tuimala R. Intrapartum carditocography the dilemma of interpretational variation. J. Perinantmed. 2006: 34: 298-302.
6. Hafizur R,Renjhen p,Dutta s,Kar,S.Admission cardio topography;istrile in predicting foetal outcome in High risk obstetric patients.AMJ 2012.5(10);522-527
7. Kansal r,Goel G,Mangala D,Garg p,Verma k,Geethiks correlation of admission test with neonatal outcome.People J of scientific research,2014;27-31
8. Garg s,Gupta A,Madhavan j.Non stress test as an admission test to assess the outcome in High risk pregnancy.International Journal of Reproduction,contraception, Obstetrics and Gynecology 2016 Dec14;5(11);3993-4000
9. Manisha Gupta,Teena nagar,p unit Gupta J,Role of cardiotocography to improve perinatal out come in high risk pregnancy.Intetnational journal of contemporary Medical Research 2017;4(4);853-856.