



Correlation of Intraoperative Findings & Foetal Outcome in Patients with Caesarean Section for Non-Reassuring Foetal Status on Cardiotocography

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ABSTRACT

Introduction: Instances of foetal distress if not detected at the earliest can lead to adverse foetal outcomes, so proper surveillance in terms of cardiotocographic abnormal findings, intraoperative findings have to be monitored as its early recognition can avoid unfavourable circumstances because of the foetal outcome by shortening the decision to delivery time (caesarean section in this case).

Aim: To study the correlation of Intraoperative findings (like meconium-stained liquor, cord around the neck of the foetus) and foetal outcome (like Apgar score at birth and 5 mins, NICU admission) in patients undergoing C-section for foetal status which is non-reassuring on Cardiotocography.

Study Population: Methods: This is prospective observational study. In labouring patients with non-reassuring foetal status will be conducted from September 2019 to September 2021. The study will be done on patients who are labouring. Pregnant women who underwent caesarean section for non-reassuring foetal status as detected by cardiotocographic changes and fulfilled the inclusion criteria will be enrolled in the study after due written consent. Patients history in detail, G.A, P/A, P/V & P/S examination, including Cardiotocography, will be recorded in a proforma.

Results: The abnormal cardiotocographic changes seen on CTG may be related to intraoperative findings and adverse foetal outcome, justifying the need for a caesarean section, or they may not be related causing a rise of unnecessary caesarean sections.

Conclusion: Considering the rise of unnecessary caesarean sections a proper interpretation of CTG tracings and precisely picking up cases of foetal distress is important and likely to improve foetal outcome.

Key Words: Foetal distress, Cardiotocography, Intraoperative findings, Pregnancy

INTRODUCTION

Pregnancy and childbirth are natural physiological mechanism with great pathological potential. Much of the pregnancies proceed normally but some pregnancies are more complicated placing the mom, or the growing foetus or both at an increased risk of bad consequences. In certain cases, adverse effects can lead to immediate foetal problems. Such an adverse outcome should be reported by an appropriate surveillance system at the earliest point in time. Adverse outcomes can be avoided during labour by obstetricians if they are sim-

ply more aware of parameters related to early recognition of foetal distress.¹

Bupivacaine with ketamine is a good adjunct for a subarachnoid block in surgeries of the lower abdomen (caesarean section in this case), with also a reported low number of breast carcinoma cases in women who are multiparous as opposed to nulliparous.^{2,3} Many studies have been found to work towards improving maternal health while dealing with complexities like PIH, Postpartum eclampsia. One of the commonest issue in the field of medicine seen in a mom

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ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 22.08.2020

Revised: 10.10.2020

Accepted: 06.11.2020

Published: 30.11.2020

who is expecting is, synonymously known as the disease of maternal endothelium or Pregnancy Induced Hypertension (PIH). A powerful widener of blood vessels, Nitric oxide let out by cells of the endothelium, helps in treating Pregnancy Induced Hypertension PIH.^{4,5,6} Some also contribute towards improving the nourishment policies of children and varied interest in reviewing challenges of diet, exercise & sexual activity in adolescents.^{7,8,9}

Foetal distress is used when in pregnancy or labour, adequate amounts of oxygen are not received by the foetus resulting in its distress, diagnosed by an abnormal foetal heart rate. Foetal distress is an ill-defined ambiguous term having the potential to lead for an improper treatment, thus ACOG agrees that the term “Foetal Distress” to be replaced by “non-reassuring foetal status.” Also, ACOG further wants additional findings of foetal tachycardia, bradycardia, etc be included. In Ancient times, during labour, monitoring of foetal heart rate was done by the means of auscultation. It has now been replaced by cardiotocography, an electronic foetal monitoring system showing foetal heart rate changes and their consequent temporal relationship with contractions of the uterus. Thus, a more reliable indicator to detect non-reassuring foetal status is Cardiotocography.¹⁰

The ultimate goal of observing the foetus after birth is to diagnose imminent foetal asphyxia to avoid ensuing acidemia and damage to cells. In the 1960s, it became accessible to the general public., Following which the use of Electronic Foetal Monitoring after birth increased swiftly, with achieving good foetal health after delivery becoming the ultimate priority. This can be done either by making use of assisted techniques of delivery like forceps or by C- section for an excellent perinatal outcome.¹¹ Thus the ultimate goal of intrapartum assessment of foetus is to identify accurately and safely foetuses who are affected negatively by the stresses of labour.¹²

CTG is influenced by hypoxic, metabolic or qualitative maternal blood alterations. Besides bradycardia and tachycardia, lack of variability, flat/smooth foetal heart rate (FHR) baseline and decelerations are also suggestive of hypoxic injury. Meconium stained liquor (MSL) may also indicate foetal distress in 12 -16% of primigravida. It may or may not reflect as abnormal foetal heart rate.¹³ With these issues in mind, we undertake this study intending to correlate non-reassuring foetal status with intraoperative findings and foetal outcome.

RATIONALE

Non-reassuring foetal status is a relatively common obstetric problem where a normal pregnancy can turn into a high-risk situation. Non-reassuring foetal status is because of foetal hypoxia and metabolic acidosis. Cardiotocography

is a widespread investigation used to detect foetal distress. It is necessary to study cardiotocography pattern associated with Non-reassuring foetal status and concurrently study its intraoperative findings and compare with foetal outcome. We aimed to study the correlation of Intraoperative Findings (like meconium-stained liquor, cord around the neck of the foetus) and foetal outcome (like Apgar score at birth and 5 mins, NICU admission) in patients undergoing Caesarean section for non-reassuring foetal status on Cardiotocography. We will correlate intraoperative findings like meconium-stained liquor cord around the neck of the foetus with women undergoing caesarean section for non-reassuring foetal status on CTG. Also will correlate foetal outcome like APGAR score at birth and 5 minutes NICU admission with women undergoing section caesarean for foetal status which is non-reassuring on CTG. Further we will compare intraoperative findings with the foetal outcome with women undergoing section caesarean for foetal status which is non-reassuring on CTG.

MATERIALS AND METHODS

Study setting: Dept. of Obstetrics and Gynaecology, AV-BRH, J.N.M.C located in a small town Sawangi (Meghe), Wardha, Maharashtra in central India.

Study type: Prospective observational study approved by Ethics Committee of JNMC, Sawangi (Meghe), Wardha.

Expected duration: 2 years

Study population: Patients in labour with non-reassuring foetal status who will undergo Caesarean Section. In labour patients with non-reassuring foetal status, Dept. of Obstetrics and Gynaecology, AVBRH Jawaharlal Nehru Medical College located in a small town Sawangi (Meghe), Wardha, Maharashtra in central India.

Inclusion Criteria

The patient who is willing to get enrolled in the study,
Women of gestational age at 36 weeks and above,
Primigravida and multigravida,
Singleton pregnancy,
Cephalic presentation,
Cardiotocographic changes showing foetal distress in women who have undergone a caesarean section.

Exclusion Criteria:

Patients who are not ready to get enrolled in the study,
All patients with Normal CTG,
Gestational age <36 weeks,
Multigravida,

Previous Caesarean Section,
Congenital anomalies,
Abnormal presentation,
Multiple gestations,
High-risk pregnancy,
Antepartum haemorrhage.

Sample size: Formula for the difference between two proportions:

“This calculator uses the following formula for the sample size n:

$$n = (Z_{\alpha/2} + Z_{\beta})^2 * (p_1(1-p_1) + p_2(1-p_2)) / (p_1 - p_2)^2,$$

where,

$Z_{\alpha/2}$ is the critical value of the Normal distribution at $\alpha/2$ (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96),

Z_{β} is the critical value of the Normal distribution at β (e.g. for a power of 80%, β is 0.2 and the critical value is 0.84) and

p_1 and p_2 are the expected sample proportions of the two groups.”

P_1 = Expected number of patients had babies with low APGAR score in group A

$$= 43.9\% = 0.439$$

P_2 = Expected number of patients had babies with low APGAR score in group B = 30% = 0.30

$$N = \frac{(1.96 + 0.84)^2 [0.439(1 - 0.439) + 0.30(1 - 0.30)]}{(0.439 - 0.30)^2}$$

$$= 120 \text{ patients per group}$$

Study Reference: Bhatia N et al. Intraoperative findings in primary caesarean section for NRFS and its correlation with cardiotocography Int J Reprod Contracept Obstet Gynecol. 2018 Jun;7(6):2351-2354.

Study Endpoints

Foetal outcome keeping in view A) APGAR score (1) birth; (2) at 5 minutes B) NICU admission

Statistical Methods: Chi-square Test, Student's unpaired t test

Side of the test: Two-sided

Level of significance: 5%

Power of the test: 80%

Formula Reference: Wang, H. and Chow, S.-C. 2007.

Software Used: SPSS version 24.0, GraphPad Prism 7.0 version and EPI-INFO 7.0 version.

PROCEDURE

After getting a positive nod from the ethical clearance party, the study will be conducted from September 2019 to September 2021. The study will be done on labouring women, in the department of Obstetrics and Gynaecology at AVBRH Sawangi Meghe Wardha. Pregnant women who went for C-section for non-reassuring foetal status as diagnosed by cardiotocographic changes according to inclusion criteria will be included in the study after due written consent.

Patients history in detail, age of gestation, abdominal examination, vaginal and speculum examination, including CTG will be recorded in a proforma. Those women whose CTG shows signs of non-reassuring foetal status will be included in the study. Intraoperative findings like meconium stained liquor and cord around the neck will be noted during caesarean section. These findings will be correlated with Foetal outcome as mentioned. The data collected will be subjected to statistical analysis.

EXPECTED RESULTS

The abnormal cardiotocographic changes seen on CTG may be related to intraoperative findings and adverse foetal outcome, justifying the need for a caesarean section., or they may not be related causing a rise of unnecessary caesarean sections. Comparing cardiotocography with intraoperative findings like a) meconium-stained liquor; b) cord around the neck of the foetus.

DISCUSSION

CTG is done in abnormal CTG cases and is uncomplicated, relatively easy to perform and can make the obstetrician aware of important. The high rate of unnecessary caesarean deliveries due to CTG diagnosed abnormal foetal heart rate patterns and their non-correlation with early neonatal outcome. The foetal outcome can be improved and unjustified caesarean section can be reduced by the proper interpretation of CTG Tracings and at the same time precise picking up of foetal distress cases. Few pieces of evidence from the Global burden of disease are available.^{14,15}

CONCLUSION

Considering the rise of unnecessary caesarean sections a proper interpretation of CTG tracings and precisely picking up cases of foetal distress is important and likely to improve foetal outcome.

ACKNOWLEDGMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references to this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals, and books from which the literature for this article has been reviewed and discussed.

Conflict of Interest: Nil

Source of Funding: Nil

REFERENCES

1. Haws RA, Yakoob MY, Soomro T, Menezes EV, Darmstadt GL, Bhutta ZA. Reducing stillbirths: screening and monitoring during pregnancy and labour. *BMC Pregn Childbirth* 2009;9(S1): S5.
2. Gantasala BV, Singam A, Taksande K. Bupivacaine (0.5%) versus (0.5%) Bupivacaine with Ketamine (50 mg) for Subarachnoid Block in Lower Abdominal Surgeries: A Randomised Comparative Study. *J Clin Diagn Res* 2019 ;13(3).
3. Lamture YR, Salunke B, Shahabuddin M. Carcinoma of Breast – A Study Profile. *J Evol Med Dental Sci* 2018; 7: (45): 4857–61.
4. Gaikwad KB, Joshi NG, Selkar SP. Study of nitrosative stress in Pregnancy Induced Hypertension. *J Clin Diagn Res* 2017;11(3): BC06.
5. Singh H, Agrawal M, Bhake A, Gupta N. Colour doppler evaluation in high-risk pregnancy and perinatal outcome. *J Evol Med Dental Sci* 2018;7(43):5403-9.
6. Singhal S, Baheti A, Singh K, Acharya S, Acharya N. Cortical blindness in posterior reversible encephalopathy syndrome in postpartum eclampsia. *Ind J Med Specialities* 2019;10(4):229.
7. Puri S, Fernandez S, Puranik A, Anand D, Gaidhane A, Syed ZQ, et al. Policy content and stakeholder network analysis for infant and young child feeding in India. *BMC Public Health* 2017;17(2):461.
8. Uddin S, Mahmood H, Senarath U, Zahiruddin Q, Karn S, Rasheed S, et al. Analysis of stakeholders networks of infant and young child nutrition programmes in Sri Lanka, India, Nepal, Bangladesh and Pakistan. *BMC Public Health* 2017;17(2):405.
9. Gaidhane AM, Sinha A, Khatib MN, Simkhada P, Behere PB, Saxena D, Unnikrishnan B, Khatib M, Ahmed M, Syed ZQ. A systematic review on the effect of electronic media on diet, exercise, and sexual activity among adolescents. *Ind J Comm Med* 2018;43(1): S56.
10. Banu S. Relationship between Abnormal CTG and foetal Outcome. *NJOG* 2015;10(2):36-39
11. Ramanah R, Martin A, Clement MC, Maillet R, Riethmuller D. Fetal scalp lactate microsampling for non-reassuring fetal status during labour: a prospective observational study. *Fetal Diagn Ther* 2010;27(1):14-9.
12. Kumar BV, Raj SV, Devi S. Abnormal fetal heart tracing patterns in patients with meconium staining of amniotic fluid and its association with perinatal outcomes. *Int J Reprod Contracept Obstet Gynecol* 2015;4(3):629-633.
13. Bhatia N, Krishna Kumari M. Intraoperative findings in the primary caesarean section for non-reassuring fetal status and its correlation with cardiotocography. *Int J Reprod Contracept Obstet Gynecol* 2018;7(6):2352.
14. Wang H, Abbas KM, Abbasifard M, Abbasi-Kangevari M, Abbastabar H, Abd-Allah F, et al. Global age-sex-specific fertility, mortality, healthy life expectancy (HALE), and population estimates in 204 countries and territories, 1950–2019: a comprehensive demographic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020;396(10258):1160–203.
15. Murray CJL, Aravkin AY, Zheng P, Abbafati C, Abbas KM, Abbasi-Kangevari M, et al. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020;396(10258):1223–49.