ORIGINAL ARTICLE

Women with Non-Reactive Cardiotocography: Examine the Neonatal Outcomes

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ABSTRACT

Objective: To examine the neonatal outcomes in women presented with non-reactive cardiotocography such as Apgar score, meconium liquor, birth weight, NICU admission and neonatal mortality.
Study Design: Cross-sectional/Observational
Place and Duration of Study: Department of Gynaecology and Obstetrics, Muhammad College of Medicine (former Al-Razi Medical College), Muhammad Teaching Hospital, Peshawar 1st October 2019 to 31st March 2020.
Methods: One hundred and fifty women having ages 20 to 40 years presented with non-reactive cardiotocography were enrolled in this study. Patients with multiple gestation, anomalous fetus and admitted for elective caesarean section were excluded from study. Neonatal outcomes such as Apgar score, meconium stained liquor, low birth weight, need for NICU admission and neonatal mortality were examined.
Results: Mean gestational age was 39.14±1.52 weeks. 84 (56%) patients were primipara while 66 (44%) patients were multipara. 90 (60%) patients had cesarean section mode of delivery. 58 (38.67%) patients had Apgar score <7 at 5 minute and 92 (61.33%) had score >7. Meconium stained liquor was found in 50 (33.33%) patients, 80 (53.33%) neonates had low birth weight, 45 (30%) neonates had needs for NICU admission and 10 (6.67%) neonates were died.
Conclusion: Cardiotocography is very useful screening tool for examine the fetal state. Non reactive cardiotocography is associated with adverse neonatal outcomes.
Keywords: Non-reactive cardiotocography, Fetus state, Neonatal outcomes

INTRODUCTION

Fetal surveillance is extremely important for the delivery of a healthy baby. Journey of the fetus through the birth canal is a stressful process which can be manifested by the fetus as a 'stress response' in the form of fetal heart rate (FHR) abnormalities. Some fetuses may be in stress prior to the onset of labor.[1] Fetal distress, a common occurrence and cause of concern for both patient and the treating obstetrician, can be the harbinger of perinatal morbidity and mortality. To minimize these untoward outcomes, it is essential to determine the intrauterine fetal condition which can be achieved by intrapartum fetal monitoring.[2]

Intrapartum fetal monitoring not only gives the idea about fetal condition but also identifies fetuses at risk of hypoxic damage so that perinatal outcome can be optimised by appropriate and timely intervention.[3] Admission test by cardiotocography (CTG) is used to indicate not only the state of oxygenation of the fetus on admission of the mother non- invasively but also checks the fetal reserve by recording FHR during the phase of temporary occlusion of the utero-placental blood supply under physiological stress of repeated uterine contractions. Thus, taking a short recording of fetal heart rate on admission helps us to determine the ability of the fetus to withstand the stress of labor.[4] For these reasons electronic fetal monitoring by cardiotocography is widely established obstetric practice. However critics of this method of fetal surveillance claim that it has led to rise in the rate of caesarean section due to false positive results (the false-positive rate for a reactive CTG is 2-5%, versus 50-80% for non-reactive CTG).[5-7]

Economic constraints especially in developing countries like ours, is also a limiting factor for the use of cardiotocographic or electronic fetal monitoring (EFM) for all antenatal patients admitted to the labor room. This continuous EFM was recommended for high risk patients but FHR changes, fetal hypoxia and acidosis may occur with same frequency in low risk patients as in high risk ones.[8] Busy labor rooms with limited CTG monitors make it difficult to select patients for continuous EFM.

Based on the postulation that the early uterine contractions of labour may put stress on the placental circulation; an AT might detect pre-existing intrauterine fetal hypoxia and also that hypoxia which develops in active labor thereby allowing early detection of such compromised fetuses and prompt intervention.[9,10]

MATERIALS AND METHODS

This cross-sectional/observational study was conducted at Department of Gynaecology and Obstetrics, Muhammad College of Medicine, Muhammad Teaching Hospital, Peshawar 1st October 2019 to 31st March 2020. One hundred and fifty women 20 to 40 years with gestational age >37 weeks and presented with non-reactive cardiotocography were enrolled. Patients with twin pregnancies, anomalous fetus and admitted for elective caesarean section were excluded. Patient's detailed demographics including age, gestational age, parity and mode of delivery were recorded. Cardiotocography was

defined as non-reactive when fetal tachycardia >150bpm, fetal Bradycardia <110, reduce or absent beat to beat variability, late deceleration and extreme variable deceleration. Neonatal outcomes such as Apgar score at 5 minutes, meconium stained liquor, need for NICU admission, low birth weight and neonatal mortality were examined. Data was analyzed by SPSS 24.

RESULTS

Fifty (33.3%) women were between 20-25 years, 72 (48%) between 26 to 30 years and 28 (18.67%) above 30 years. Mean gestational age was 39.14±1.52 weeks. 84 (56%) patients were primipara while 66 (44%) patients were multipara. 90 (60%) patients had cesarean section mode of delivery while 60 (40%) patients had normal vaginal delivery (Table 1).

According to the neonatal outcomes, 58 (38.67%) patients had Apgar score <7 at 5 minute and 92 (61.33%) had score >7. Meconium stained liquor was found in 50 (33.33%) patients, 80 (53.33%) neonates had low birth weight, 45 (30%) neonates had needs for NICU admission and 10 (6.67%) neonates were died (Table 2).

Table 1: Demographic information of the all the patients

Variable	No.	%
Age (years)		
20 – 25	50	33.33
26 - 30	72	48.0
>30	28	18.67
Gestational age	39.14±1.52	
Parity		
Primipara	84	56.0
Multipara	66	44.0
Mode of delivery		
Cesarean Section	90	60.0
Normal Vaginal	60	40.0

Table 2: Neonatal outcomes in women with non-reactive cardiotocography

Neonatal outcome	No.	%
Low birth weight		
Yes	80	53.33
No	70	46.67
Apgar score at 5 min		
<7	58	38.7
>7	92	61.3
Meconium stained liquor		
Yes	50	33.33
No	100	66.67
NICU admission		
Yes	45	30.0
No	105	70.0
Mortality		
Yes	10	6.67
No	140	93.33

DISCUSSION

Intrapartum fetal monitoring plays an important role for decision making about the maternal and neonatal health. Electronic fetal monitoring is very useful screening tool and helps to reduce the adverse maternal and perinatal outcomes.[11,12] The present study was conducted with aimed to examine the neonatal outcomes in women with non-reactive cardiotocography. In this regard 150 patients with non-reactive cardiotocography were analyzed. Majority of patients 66.67% were ages above 25 years and mean gestational age was 39.14±1.52 weeks. These results were comparable to many of previous studies conducted regarding cardiotocography in which majority of patients 58% to 70% were ages between 25 to 35 years and average gestational age was 37.8 weeks.[13,14]

In present study we found that 84 (56%) patients were primipara while 66 (44%) patients were multipara. 90 (60%) patients had cesarean section mode of delivery while 60 (40%) patients had normal vaginal delivery. A study conducted by Kavitha et al[15] regarding cardiotocography in labour and fetal outcomes and they reported 40% patients were primigravida while 60% were multigravida and 35% patients had cesarean section mode of delivery while 63.33% patients had normal vaginal deliveries. Another study by Salma et al[16] reported that 76.7% patients had cesarean section mode of delivery in women with non-reactive cardiotocography.

In the present study, neonatal outcomes showed that 58 (38.67%) patients had Apgar score <7 at 5 minute and 92 (61.33%) had score >7. These results were similar to the study conducted by Ansari & Kosar[17] in which they reported that women with non-reactive cardiotocography had Apgar score of baby>7 at 5 minutes was 89.3%. Meconium stained liquor was found in 50 (33.33%) patients. Joshi et al[18] reported meconium stained liquor in 33.3% patients.

In present study we found that 80 (53.33%) neonates had low birth weight. A study by Bhartiya et al[19] regarding to identify on admission to the delivery unit the fetus at increased risk of intrapartum hypoxia. They conducted a study to evaluate the efficacy of CTG in low- and high-risk women. In their study 31% patients had low birth weight <2500 g. Ansari & Kosar[17] reported 59.4% babies had birth weight <3kg.

In our study 45 (30%) neonates had needs for NICU admission and 10 (6.67%) neonates were died. These results were similar to the study conducted by Salma et al[16] in which 35% neonates had need for admission to NICU and early neonatal mortality was reported as 8%. Another study by Salahudin et al[20] reported that women with non reactive cardiotocography had a high rate of neonatal adverse outcomes and in their study the neonatal mortality rate was 13.9%. Some other studies were to our findings regarding neonatal outcomes.[21,22]

CONCLUSION

Cardiotocography is very useful screening tool for examine the fetal state. Non reactive cardiotocography is associated with adverse neonatal outcomes. CTG monitoring along with timely obstetrical intervention and can reduce associated complications and improve fetal outcome.

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