



TO COMPARE NEONATAL OUTCOME IN FETAL DISTRESS ON CARDIOTOCOGRAPHY IN CLEAR LIQUOR VERSUS MECONIUM STAINED LIQUOR.

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Article received on:

18/09/2018

Accepted for publication:

07/02/2019

Received after proof reading:

28/08/2019

ABSTRACT... Objectives: To compare neonatal outcome in laboring patients having fetal distress on cardiotocography in clear liquor vs meconium stained liquor. **Study Design:** Cohort study. **Setting:** Department of Obstetrics and Gynaecology, Military Hospital, Rawalpindi. **Period:** Six months from 31-01-2016 to 30-07-2016. **Patients and Methods:** One hundred and eighty two patients (91 in each group) were included in this study. All relevant information was recorded on a preset data collection proforma that included gestational age, cardiotocography (CTG) details, color of liquor and Apgar score at 1 and 5 minutes after birth. In all admitted patients CTG was carried out. **Results:** The age ranged from 20-40 years of the patients with Mean \pm SD age of 29.8 \pm 6.1 and 30.4 \pm 5.7 year in group-A and B, respectively. Regarding Apgar score at 1 minute, 2 (2.1%) babies from group-A and 9 babies (9.8%) from group-B had Apgar score <4. Similarly, Apgar score at 5 minutes, 1 baby (1.1%) from group-A and 10 babies (10.9%) were having Apgar score < 4. **Conclusion:** Meconium staining with CTG changes is a more significant sign of fetal distress as compared to CTG changes alone.

Key words: Apgar Score, Cardiotocography, Meconium Stained Liquor.

Article Citation: Fareed A, Haroon Y, Ahmad A. To compare neonatal outcome in fetal distress on cardiotocography in clear liquor versus meconium stained liquor. Professional Med J 2019; 26(9):1562-1566.

DOI: 10.29309/TPMJ/2019.26.09.4025

INTRODUCTION

Cardiotocography (CTG) detects variation in the fetal heart rate and their temporal relationship to the contractions of the uterus.¹

Fetal surveillance during labour is important for the assessment and predicting adverse neonatal outcome. Fetal well being was previously assessed by the colour of liquor after rupture of membranes. A protocol based approach is required for the management of newborns delivered through meconium stained amniotic fluid so that adverse outcomes are decreased and the minimum number of newborns need ventilator support.² Various technological advances including electronic fetal heart monitoring using CTG have enhanced our ability to assess fetal distress. However, when it is used alone, it was used to have high sensitivity (87%) but low specificity (66%). Its negative predictive value is 92% and positive predictive value is 54%.

Therefore, normal CTG is more predictive of

normal outcomes than abnormal CTG regarding abnormal outcomes.³ Therefore, it leads to an increase in the number operative deliveries all over the world. It is also a fact that non-reassuring fetal heart rate assessed by cardiotocography alone does not correlate well with adverse neonatal outcome.⁴ A combination of abnormal CTG findings coupled with meconium stained amniotic fluid was known to be associated with an increased risk of adverse perinatal outcomes.⁵ Many studies support the combined approach using CTG along with meconium stained liquor. The presence of abnormal fetal heart rate (FHR) tracing patterns in meconium-stained amniotic fluid patient indicates an increased risk of perinatal morbidity.⁶ Neither of the parameters are significant alone but their combination increases that predictive value.⁷

The rationale of study is to evaluate the combined use of CTG along with meconium staining of liquor in the intrapartum assessment of adverse neonatal outcome with a view to identify high risk

cases for necessary intervention.

METHODS

This Study was carried out over a period of six months from 31-01-2016 to 30-07-2016 in the Department of Obstetrics and Gynaecology, Military Hospital, Rawalpindi. WHO sample size calculator was used to calculate a sample size of 91 in each group using the level of significance 5%, power of test 80%, anticipated population proportion P1 1%⁷ and anticipated population proportion P2 9%.⁷ Non-probability, consecutive sampling technique was used.

All labouring women having term pregnancy with fetal distress diagnosed on CTG having clear liquor (Control group) and meconium stained liquor (Cohort group). Exclusion criteria included Pregnancy less than 37 weeks, pregnancy with antepartum hemorrhage, pregnancy with prolonged rupture of membranes with fever and pregnancy with gross structural abnormalities of fetus.

Total 182 patients fulfilling the inclusion criteria were admitted in hospital either through emergency or out-patient department were included in this study. Informed consent was taken from all patients. All relevant details were noted on a preset data collection proforma including gestational age, CTG details, colour of liquor and Apgar score at 1 and 5 minutes after birth. In all admitted patients, CTG was done. In patients showing fetal distress on CTG artificial rupture of membranes was done by using instrument called Kocker forcep under aseptic condition and colour of liquor was noted.

Irrespective of the mode of delivery, the patients were divided into two groups, Group-A and group-B. Group-A was consisted of those patients who had fetal distress on CTG with clear liquor and group-B consisting of those patients who had fetal distress on CTG with meconium of liquor. Main outcome measures were noted as Apgar score at 1 minute and 5 minutes after birth which was recorded by trainee researcher. Neonatal Apgar score was noted and compared to CTG findings. Collected data was analyzed by

SPSS version 11. Descriptive statistics including mean standard deviation was computed for maternal age, gestational age, main outcome measures that is Apgar score at one minute and five minutes was expressed as numbers and percentages. Apgar score at one minute and at five minutes was compared between two groups using chi square test. P value <0.05 was considered significant.

RESULTS

During the study period from 31-01-2016 to 30-07-2016, total 182 cases were included in this study.

The age ranged from 20-40 years of the patients with mean±SD age of 29.8±6.1 and 30.4±5.7 year in group-A and B, respectively. In group-A, there were 38 patients (41.7%) and in group-B, 42 patients (46.1%) between 20-25 years of age. In group-A, 29 (31.9%) and in group-B, 30 (33.0%) patients were between 26-30. In group-A 15 (16.5%) and in group-B 13 (14.3%) were between 31-35 years while in group-A 09 (9.9%) and in group-B 6 (6.6%) were 36-40 years old. Regarding gestational age, there were 41 patients (45.0%) from group-A and 43 (47.3%) from group-B were between 37-38 weeks of gestation while 50 patients (55%) from group-A and 48 (52.7%) patients were between 39-40 weeks of gestational age. Mean gestational age was found to be 39.5±4.3 and 39.1±4.1 weeks in group-A and B, respectively. The distribution of cases by colour of liquor is shown in Table-I. Regarding Apgar score at 1 minute, 2 (2.1%) babies from group-A and 9 babies (9.8%) from group-B had Apgar score <4. Similarly, Apgar score at 5 minutes, 1 baby (1.1%) from group-A and 10 babies (10.9%) were having Apgar score < 4 (Table-II and III). The p-value was < 0.05 in both comparisons.

Colour of liquor	Group-A (Clear liquor)		Group-B (Meconium stained liquor)	
	Number	%	Number	%
Clear	91	100.0	-	-
Meconium	-	-	91	100.0
Total	91	100.0	91	100.0

Table-I. Distribution of cases by colour of liquor

Apgar Score	Group-A (Clear Liquor)		Group-B (Meconium Stained Liquor)	
	Number	%	Number	%
< 4	02	02.1	09	09.8
> 4	89	97.9	82	90.2
Total	91	100.0	91	100.0

Table-II. Distribution of cases by Apgar score at 1 minute

Chi square = 4.74 df = 1 P value = 0.029

Apgar Score	Group-A (Clear Liquor)		Group-B (Meconium Stained Liquor)	
	Number	%	Number	%
< 4	01	01.1	10	10.9
> 4	90	98.9	81	89.1
Total	91	100.0	91	100.0

Table-III. Distribution of cases by Apgar score at 5 minute

Chi square = 7.84 df = 1 P value = 0.005

DISCUSSION

Cardiotocography is the recording of the fetal heart rate via an ultrasound transducer attached to the mother's abdomen. CTG is a form of fetal assessment which at the same time not only records heart rate and movements of fetus but also the uterine contractions to detect hypoxia used mainly in those pregnancies who are at a risk of complications. The surveillance depends on the analysis of characteristic fetal heart rate and uterine contractions.⁸ A normal cardiotocography is more indicative of normal fetal outcomes than abnormal cardiotocography as far as the fetal outcome is concerned.²

In the present study, fetal outcome with abnormal intrapartum cardiotocography was observed. This is comparable to the study of Tasnim et al⁹ who examined in their study the correctness of intrapartum cardiotocography in terms of fetal base at birth. Total of 182 patients (91 in each group) were studied to compare neonatal in labouring patients having fetal distress on cardiotocography with clear liquor vs meconium stained liquor. Cardiotocography is used all over the world as a method of fetal monitoring during labour. However, CTG when used alone shows false positive test results and when done without

fetal blood sampling (FBS), it results in an increase in operative deliveries without improvement of fetal outcome. However, when CTG is combined with ST-analysis of the fetal electrocardiogram (ECG) decreases the rates of metabolic acidosis and instrumental delivery. This was also shown in a trial conducted by Westerhuis et al¹⁰ whose study showed data about the use of intrapartum ST analysis with a strict protocol for performance of FBS to limit its incidence.

Hypoxia is considered as a significant threat to the fetus during labour and may cause permanent neurological deficit and intrapartum death. Newborns who are at risk of hypoxia, are thus identified and either such babies are delivered by caesarean section or instrumental vaginal delivery. Alfirevic et al¹¹ in their study on continuous cardiotocography when used as a form of fetal well being monitoring for fetus during labour concluded that continuous CTG during labour is associated with a decrease in neonatal fits but without any significant differences in cerebral palsy and infant mortality. However, continuous CTG was associated with an rise in caesarean section and instrumental vaginal births.¹¹ Palomaki et al¹² also concluded this fact and stated in their study that to enhance its reliability, a standard classification and uniform training in CTG interpretation is required. Fawole et al¹³ carried out a similar study in Nigeria. They found that post-datism was more often related with a non-reactive test result. Women with non-reactive tests were two times at risk of delivery by emergency caesarean section, compared with women with reactive tests. Sheikh et al¹⁴ conducted a study in Karachi, Pakistan to determine the frequency of pathological pattern of CTG in antepartum and intrapartum period and to evaluate the significance of those patterns in determining fetal well-being. They concluded that no significant association was found between a pathological CTG recording, fetal Apgar score and acidosis if the pathological trace is used alone to assess fetal well-being. These are consistent with results of our study.

Studies have shown that deceleration in cardiotocography is a very important and resistive

measure to show fetal hypoxia. In our study, the cardiotocographic findings observed were similar to the results of the study conducted by Chaturvedi P et al¹⁵ in China. The decelerations during intrapartum period play a significant role in predicting prenatal outcome than any other parameters. Fetal heart changes occur in the majority of labour but show poor relation with perinatal outcome. In present study, abnormal cardiotocographic findings were evaluated in order to preserve the fetus from irreversible damage. This was similar to the study of Grignaffini et al¹⁶ who studied the role of CTG in fetal distress. Fetal outcome in current study was observed by Apgar score at 1 minute and 5 minutes. Apgar score less than 4 at one minute found 2.1% in group with clear liquor and 9.8% in group with meconium stained liquor ($p=0.029$). Apgar score less than 4 at five minute found 1.1% in group with clear liquor and 10.9% in group with meconium stained liquor ($p=0.005$). This was similar to the study of Valentin et al¹⁷ and also support by the findings of Waqar et al.⁷

CONCLUSION

Meconium staining with CTG changes is a more significant sign of fetal distress than CTG changes alone.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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1	Amna Fareed	Research work	
2	Yousaf Haroon	Literature search	
3	Asrar Ahmad	Statistical Analysis	