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ORIGINAL ARTICLE

Importance of Intermittent Cardiotocographic Monitoring Prior to Misoprostol-Assisted Induction of Labour

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ABSTRACT

Aim: To determine the importance of intermittent cardiotocographic monitoring during misoprostol-assisted induction of labour in pregnancies lasting weeks or more.

Methods: This descriptive study was carried out in the Obstetrics and Gynecology department of Combined Military Hospital, Kharian Cantt for the duration from January 2022 to August 2022 among 130 primigravida patients underwent CTG before receiving transvaginal dose of misoprostol. Neonatal admissions, the mode of delivery, the Apgar score, and indications of induction were the variables examined.

Results: Forty-two (70%) of the C-section patients had reassuring CTG and significantly low Apgar scores at 1 minute. Seven (8.5%) of the patients with thick meconium had non-reassuring CTG. Twelve neonates (9.2%) in total required resuscitation, 9 (75%) of whom had reassuring CTGs while 3(25%) had non-reassuring CTGs. The overall admission rate in NICU was 10%, and 38.5% of neonates that required resuscitation had non-reassuring CTG. Neonatal mortality was nil during the study time.

Conclusions: Patients who had their labour induced with misoprostol had non-reassuring CTG among 50% of cases and had thick meconium stained liquor. Therefore, we can lower neonatal morbidity and mortality by early foetal impairment detection. Neonatal mortality was nil during the study time.

Keywords: cardiotocography, induction, resuscitation, Apgar score and caesarean section

INTRODUCTION

Induction is intended to start contractions prior to the onset of labour on its own, whether or not the amniotic sac ruptures[1-2]. It is suggested when the advantages to the mother or the fetus outweigh the benefits of continuing the pregnancy[3-4]. The most frequent causes are post-term pregnancy, pre-labor membrane rupture, hypertension, oligohydramnios, and different maternal illnesses[5]. Cardiotocography (CTG) uses the Doppler Effect, a physical principle, to identify foetal heart motion as part of an antenatal record of the foetal heart rate (FHR)[6]. To determine the foetal state at that time, the RCOG established standards for CTG interpretation. Based on a number of factors, including baseline FHS (110–160 bpm), variability (5–25), the lack of deceleration and at least two accelerations, CTG could be non-reassuring, normal (reassuring) or pathological[7]. Cervical ripening has been instigated with misoprostol. FIGO states that 25 µg of misoprostol can be given per-vaginally 6-hourly. In contrast to Dinoprostone, Misoprostol (PGE1) is stable, less expensive and easy to administer (orally, vaginally, or rectally)[8-9]. It also has less adverse effects, a shorter induction-delivery interval, a lesser requirement for oxytocin, and a lesser likelihood of induction failure as compared to Dinoprostone (PGE2)[10]. This study has been conducted to determine the importance of intermittent cardiotocographic monitoring during misoprostol-assisted induction of labour in pregnancies lasting weeks or more.

METHODS

After receiving ethical approval, a hospital-based descriptive study was carried out in the Obstetrics and Gynecology department of Combined Military Hospital. Kharian Cantt for the duration from January 2022 to August 2022 among 130 primigravida patients underwent CTG before receiving transvaginal dose of misoprostol. Misoprostol was used to induce labour among females with gestational age of 41 weeks or above who were aged 20 to 34 years old. The patients with history of uterine surgery, prostaglandin allergy, psychiatric illness, intrauterine foetal death, foetal anomalies, cephalo-pelvic disproportion, multiple pregnancies and obstetric complications like malpresentation, antepartum hemorrhage and HIV were omitted. The RCOG criteria were used as the basis for interpretation. Two doses of the 25 microgram Misoprostol tab were placed in the posterior fornix under aseptic conditions, six hours apart, as per hospital protocol. Throughout the course of labour, the patient was monitored, and a partograph of their progress was plotted. If spontaneous rupture of membranes did not occur in all of the patients, artificial rupture of membranes (AROM) was performed to determine the colour of the liquid during the active phase of labour. According to the partograph and obstetric indications, the delivery method was chosen. At one and five minutes after birth, the Apgar score was recorded. All newborns were followed-up until hospital discharge. Neonatal admissions, the mode of delivery, the Apgar score, and indications of induction were the variables examined. The primary outcome indicator was the CTG pattern prior to misoprostol insertion. Secondary outcomes evaluated included the time between the start of induction and the vaginal delivery, the mode of delivery, induction to delivery time, maternal complication and the number of caesarean deliveries. Using SPSS 23.0, the data entered were analysed, and the findings were presented as tables, charts, and diagrams.

RESULTS

Among 130 cases of primigravida with a gestational age of 41 weeks or above; 21.68 ±3.2 years was the median maternal age with 20-28 year of age range, and postdated pregnancy (61.5%) was the most common reason for inducing labour, followed by gestational hypertension in 20(15.4%), decreased foetal movements in 16(12.3%), PROM in 4(3.1%) and borderline oligohydramnios in 10(7.7%) patients.

Table-1: shows the various causes of labour induction

Causes	No (%)
Post-dated Pregnancy	80(61.5%)
Gestational hypertension	20(15.4%)
Decreased foetal movements	16(12.3%)
Borderline oligohydramnios	10(7.7%)
PROM	4(3.1%)

Misoprostol was required in two doses in 89 (68.5%%) of the cases, but one dose was needed in 41 (31.5%) of the cases, and the average time from induction to delivery was 21.20 ± 9.18

hours. 96 (73.8%) of the females delivered between 4 and 18 hours after induction, whereas 34 (26.2%) did so after 18 hours.

Table-2: shows the dosage of Misoprostol given and delivery time of patients

Misoprostol doses	
One	89 (68.5%%)
Two	41 (31.5%)
Average time from induction to delivery	21.20 ± 9.18 hours
Non- reassuring CTG after 2nd dose	16 (12.3%)
Delivery Time	
4-18 hrs	96 (73.8%)
>18 hrs	34 (26.2%)

The precipitate labour was not noted in any patient. CTG results obtained prior to the misoprostol dose were reassuring. 16 (12.3%) patients exhibited non-reassuring CTG prior to the second dosage of misoprostol, including 6 (37.5%) cases of foetal bradycardia, 7 (43.8%) cases of decelerations and 3 (18.7%) cases of foetal tachycardia. When the liquor was evaluated; 82 (63.1%) females have thick meconium, 31 (23.8%) have moderately thick meconium, 15 (11.5%) had clear meconium and 2 (1.5%) have bloody meconium. Seven (8.5%) of the patients with thick meconium had non-reassuring CTG.

Table-3: shows the meconium status of the patients

Meconium status	
Thick meconium	82 (63.1%)
Moderately thick meconium	31 (23.8%)
Clear meconium	15 (11.5%)
Bloody meconium	2 (1.5%)

60 (46.2%) patients underwent caesarean sections, while 65 (50%) women gave birth vaginally and four (3.1%) patients had vacuum assisted delivery and one (0.7%) forceps delivery. 42 (70%) of the C-section patients had reassuring CTG while 18 (30%) had non-reassuring CTG. Though, there are no vaginal deliveries amongst patients having non-reassuring CTG.

Twelve neonates (9.2%) in total required resuscitation, 9 (75%) of whom had reassuring CTGs while 3(25%) had non-reassuring CTGs. The overall admission rate in NICU was 10%, and 38.5% of neonates that required resuscitation had non-reassuring CTG. Neonatal mortality was nil during the study time.

Table-4: shows the Neo-natal characteristics grounded on CTG type

Parameters	Reassuring CTG	Non- reassuring CTG	Total
Apgar 1min < 7	20	13	33
Apgar 1min ≥7	90	7	97
Apgar 5min < 7	13	5	18
Apgar 5min ≥7	95	17	112
Neonatal resuscitation	8	5	13
NICU admission	9	3	12

DISCUSSION

Various studies have given different recommendations. The best use of labour resources can be achieved by identifying patients who are likely to have unfavorable foetal outcomes using CTG, according to a study by Sandhu et al[11]. Misoprostol is recommended by the RCOG and ACOG because it is effective for labour induction and cervical ripening. In Elati A et al and Nassar et al study; the mean ages were comparable to this study which were 24.65±4.42yrs and 29.3±6yrs, respectively among all primigravida females[12-13]. According to WHO recommendations, common reasons for inducing labour include being postdated, having a PROM, having hypertensive problems, having complications with the mother's health, having a dead fetus, and having a fetus with a growth restriction, which this study also revealed[14]. The most frequent reasons for labour induction, according to Nasser et al and Sanchez-Ramos L et al were postdated pregnancy and pregnancy-induced hypertension[14-15]. Similar findings to this study were found in studies by Nasser et al, Buocha F et al, Osmundson et al and Batrusevicius et al regarding the time from induction to delivery[16-19]. Studies by Athota S. et al., Rahman H. et al., Asghar S. et al., Dvnane D. et al., Umber F. et al and Aflirevic Z. et al revealed that continuous cardiotocography significantly increased the number of vaginal deliveries and reduced the c-sections[20-23]. In contrast to this study, a study by Atohta S. et al, Umber S. et al, Syeda et al., Zahran et al and Bartusevicius et al. found lower incidences of meconium-stained liquor: 18.6% in group 1 and 21.3% in group 2, respectively[24-26]. In this study, we compared the neonatal outcomes in terms of NICU hospitalization, meconium stained liquor and Apgar score at 1 minute.

There were more healthy infants with good APGAR scores in the studies by Zahran et al and Umber F et al than in the studies by Daly N et al and Athota S et al. NICU admission rates were 14.1% in group 1 and 22.1% in group 2 in the Athota S et al study[27-28]. In group 2, the neonatal mortality was 5%, while in group 1, no neonatal mortality was noted. The findings from studies by Zahran et al and Syeda et al exhibited that 2 (2%) and 19 (1%) infants respectively needed NICU admission. Chew FT et al study revealed a greater rate of perinatal death (1.6%)[29]. However, Saastad E. et al study exhibited just 4% of newborns had an Apgar score less than 7 at 1 mint which improves after 5 mints in 92% of cases. The frequency of NICU hospitalization was higher significantly in neonates delivered from mothers with anomalous NST groups, at 63% and 34.1%, respectively, according to studies by Daly N. et al and Rahman H. et al and our study had comparable results.

This study had the limitation of being completed in a brief amount of time. The study's sample size was small, and it was only carried out in one location. It has not been made apparent why the patient was admitted to the NICU.

CONCLUSIONS

Patients who had their labour induced with misoprostol had non-reassuring CTG among 50% of cases and had thick meconium stained liquor. Therefore, we can lower neonatal morbidity and mortality by early foetal impairment detection. There is a strong correlation between CTG findings and delivery method or Apgar score such as more vaginal births and good Apgar score in reactive CTG. Neonatal mortality was nil during the study time.

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