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ORIGINAL ARTICLE

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Fetomaternal outcome in transcervical amnioinfusion in meconium stained amniotic fluid

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OBJECTIVE(S) : To assess the effect of amnioinfusion in labors complicated by meconium stained amniotic fluid and to observe any difference in the fetomaternal outcomes in the two groups receiving amnioinfusion and monitored with and without carditocography.

METHOD(S) : Two hundred women in labor complicated by meconium stained amniotic fluid were included in the study from April 2002 to November 2003. They were divided into two groups while receiving amnioinfusion viz; Group A not monitored with cardiotocography (CTG) and Group B monitored with CTG. They were evaluated for fetomaternal outcome and other aspects of the study. For statistical analysis chi-square test was employed.

RESULTS : There was no significant difference between the mean duration of amnionfusion in the two groups. Most common CTG abnormality was variable deceleration. The rate of cesarean section was higher in Group B, the most common indication being fetal distress. Two perinatal deaths occurred in the study, both belonging to Group B.

CONCLUSION(S) : Aminoinfusion is a simple, inexpensive and feasible technique to improve fetomaternal outcome. No significant difference in the two groups, except for higher cesarean section rate in Group B, could be demonstrated. No maternal complication was noticed.

Key words : meconium stained amniotic fluid, amnioinfusion, meconium aspiration syndrome, cardiotocography

Introduction

Meconium stained amniotic fluid (MSAF) during labor is a problem in about 7 to 22% of live births [1]. Meconium aspiration syndrome (MAS) occurs in about 1.8 to 18% of infants delivered from MSAF [2]. In some series, MAS accounts for 2% of all perinatal deaths [3]. Amnioinfusion (AI) is the artificial instillation of a sterile solution of normal saline or Ringer's lactate into the uterine cavity. It is a beneficial intervention in MSAF.

Antepartum AI is a diagnostic as well as therapeutic modality in various obstetric situations associated with oligohydramnios. It facilitates evaluation by ultrasonography. Though the diagnostic role is well established, its therapeutic role is debatable. Intrapartum AI has been used as a prophylactic measure in oligohydramnios, preterm premature rupture of membranes and MSAF. Therapeutically, it has been used in the laboring uterus to correct variable decelerations and chorioamnionitis.

This study was undertaken to assess the effect of amnionfusion for meconium stained amniotic fluid, both on the mother and the newborn.

The need for cardiotocography monitoring in amnioinfusion was also evaluated.

Material and Methods

The study was conducted from April 2002 to November 2003. It was an unblinded comparative evaluation of two groups of 100 women each receiving amnioinfusion for MSAF, one with and one without CTG monitoring. Group A consisted of those monitored in labor without CTG and Group B of those who were monitored with CTG.

Women fulfilling the following criteria were included in the study.

- Singleton pregnancy
- Vertex presentation
- Gestational age of 37 weeks or more.

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- Normal fetal heart rate.
- Cervical dilation of 3-8 cm.
- Moderate and thick meconium
- Women in active labor.

Under all aseptic precautions prewarmed ringer lactate solution was instilled into the uterine cavity through a intrauterine catheter (Foley's no. 16). The rate of instillation was 500 mL over half an hour followed by 3 mL/minute till delivery.

Results and Discussion

Out of 7581 deliveries conducted in our institution during the study period, 200 women fulfilling the inclusion criteria were evaluated for the effect of amnioinfusion and were also studied to observe the fetomaternal outcome with or without CTG monitoring.

Amnioinfusion to delivery interval is shown in Table 1 and is a reflection of the time period the fetus has been surrounded by the environment containing meconium. In Group A, maximum number of women (38%) delivered between 1 and 2 hours of amnioinfusion whereas in Group B maximum number of women (47%) delivered between 2 and 4 hours. Mean duration of amnioinfusion was 132.45 and 148.13 minutes in Group A and B respectively. Rathore et al [4] needed amnioinfusion for 162 minutes in their study.

Table 1. Amnioinfusion to delivery interval

Duration (minutes)	Group A (n=100)			Group B (n=100)		
	Primi-Paras	Multi-Paras	Total	Primi-Paras	Multi-Paras	Total
≤30	3	7	10	3	-	3
31-60	6	9	15	4	5	9
61-120	19	19	38	21	10	31
121-240	20	2	22	29	18	47
241-300	3	2	5	3	2	5
>300	7	3	10	3	2	5
Mean ± SD	132.45 ± 106.48 [a]			148.13 ± 89.87[a]		

[a] $p > 0.05$

Group B was studied for various abnormal fetal heart rate pattern and it was found that only 45% had normal FHR tracing. Most common abnormality (27%) was variable deceleration followed by tachycardia (16%). Late deceleration was seen in only 2% of women (Table 2). Mode of delivery in 83.6% of the women with abnormal CTG pattern was by cesarean section.

Table 2. Cardiotocography recordings and fetomaternal outcome in Group B

Carditocography recording	AI group with cardiotocography (Group B)	Mode of Delivery			Neonatal Complications
		Vaginal	Cesarean	Forceps	
Normal	45	34	11	-	13
Bradycardia	10	3	6	1	05
Tachycardia	16	-	15	1	02
Variable deceleration	27	3	23	1	06
Late deceleration	2	-	2	-	01
Total	100	40	57	3	27

In a study by Swami et al [5], 43% of the women had significant CTG abnormality and 72% of these had interventional delivery.

The differences in the mode of delivery between the two groups were significant. (P=0.001, Table 3). Sixty-one percent and 40% delivered vaginally in Group A and B respectively. Forceps delivery was 6% in Group A as compared to only 3% in Group B. Abnormal CTG pattern was a motivating factor in Group B for greater use of LSCS viz. 57% as compared to 33% in Group A (P=0.001). Table 4 gives the indications for cesarean section.

Table 3. Distribution of cases according to mode of delivery and apgar score at 1 minute

Mode of	Group A			Group B			P	Apgar	Group	Group
delivery	Primi para	Multi-para	Total	Primi-para	Multi-para	Total	Value	Score	A	B
Vaginal	28	33	61	21	19	40	0.001	<4	1	4
Forceps	6	0	6	1	2	3	0.001	4-7	14	15
Cesarean	25	8	33	41	16	57	0.001	8-10	85	81

Table 4. Distribution of cases according to indications for cesarean section

Indication	Group A			Group B			P value
	P	M	Total	P	M	Total	
Fetal distress	13	3	16	29	10	39	0.02
CPD	7	3	10	10	5	15	NS
Previous section with CPD	0	1	1	0	1	1	0.02
PROM with fetal distress	1	0	1	2	0	2	NS
Cervical dystocia	1	1	2	-	-	-	-
Oligo hydramnios with meconium stained fluid	1	0	1	-	-	-	-
BOH	1	0	1	-	-	-	-
Persistent occifito-posterior	1	0	1	-	-	-	-
Total	25	8	33	41	16	57	

Cesarean section rate of 40.6% in cases of MSAF is reported by Sasikala et al [6] when continuous electronic fetal monitoring was being done. In a study by Peurtas et al [7], the cesarean section rate in MSAF receiving amnioinfusion was 12% and instrumental delivery rate was 18%. In a metanalysis Graham [8], 42% of patients with MSAF receiving amnioinfusion with CTG monitoring needed cesarean section as against only 10.4% without CTG monitoring.

In our study, more than 80% women in both the groups gave birth to babies with apgar ≥8. Rathore et al [4] had only 1% babies in the study group with apgar < 7 at 5 minutes. Peurtas et al [9] did not have any neonate at apgar < 7 at 5 minutes in their study.

It has been rightly pointed out that abnormal FHR pattern may be non-reassuring but not always indicative of gross fetal compromise. Reliance on the tracings of electronic monitoring was responsible for more cesarean sections for fetal distress in Group B when compared to Group A (39 vs 16, P = 0.02) (Table 4). De Meeus et al [10] reported a 6.75% cesarean section rate for fetal distress in women with MSAF receiving AI whereas Sasikala [6] reported 28% of women undergoing LSCS with fetal distress.

Neonatal complication related to meconium in both the groups was mainly asphyxia (Table 5). Neonatal outcome in mild asphyxia was excellent. Severe birth asphyxia was present in 1% in both the groups. Septicemia was responsible for one of the deaths in Group B. One baby died due to MAS with meningitis in Group B. 22.9% of those with vaginal delivery in Group A and 12.5% of those with vaginal delivery in Group B had mild birth asphyxia. 9.8% of those with LSCS in Group A and 17.5% of those in Group B had mild birth asphyxia. Moderate birth asphyxia was present in 3.2% of those delivered vaginally in Group A and 7.5% in Group B. Nine percent of those delivered by cesarean section in Group A and none in Group B had moderate birth asphyxia (Table 5). Incidence of septicemia in Group A was 1% and that baby was delivered vaginally. In Group B 5% of those delivered vaginally and 3.5% of those delivered by cesarean section had septicemia. In the study by Sasikala et al [6], 18.9% of those delivered vaginally, 9.6% of those by instrumental mode and 11.4% of those by LSCS had severe birth asphyxia. Septicemia was found in 5 out of 131 newborns; two had delivered vaginally, two by instruments and one by LSCS.

Our study emphasizes the changing trends in the management of MSAF with amnioinfusion and CTG monitoring. Transcervical amnioinfusion during labor with strict monitoring is a simple, inexpensive and useful procedure which has no apparent increase in maternal and neonatal mortality. It significantly dilutes the MSAF. No maternal complication was found in our study and CTG did not improve fetomaternal outcome.

Table 5. Complications, perinatal morbidity and mode of delivery

Complication	Group A				Group B			
	Number	Mode of delivery			Number	Mode of delivery		
		Vaginal	LSCS	Forceps		Vaginal	LSCS	Forceps
Birth asplyxia								
Mild	23	14	6	3	12	5	7	-
Moderate	5	2	3	-	3	3	-	-
Severe	1	-	1	-	1	1	-	-
Jaundice	8	6	2	-	6	2	4	-
Septicemia	1	1	-	-	4	2	2	-
MAS with meningitis	-	-	-	-	1	-	-	1
Moderate birth asphysia with meconium aspiration	1	-	1	-		-	-	-
Perinatal death	-	-	-	-	2	-	1	1
Total	39	23	13	3	27	13	13	1

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