



## Study of Efficacy of Intra-Partum Amnioinfusion towards Improvement in Fetomaternal Outcomes at a Tertiary Care Centre in Central India

### KEYWORDS

Amnioinfusion, fetomaternal outcome, meconium, liquor.

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### ABSTRACT

**Background:** Meconium Aspiration Syndrome (MAS) is a serious obstetric event, with adverse maternal & neonatal implications. Amnioinfusion has been purported to be a safe, simple & effective procedure for reduction in incidence of Meconium Aspiration Syndrome.

**Objective:** To evaluate safety & efficacy of transcervical amnioinfusion towards decreasing the incidence of meconium aspiration syndrome in patients with meconium stained liquor.

**Methodology:** 200 (100- cases, 100- controls) pregnant women were recruited in this prospective case control study. The outcomes were measured in both the groups with standard parameters keeping in mind the generalizability of the study findings.

**Observations:** Meconium Aspiration Syndrome was found to be significantly less likely to happen in study group versus control group (OR= 0.34). Neonatal mortality was reported to be 50% less likely in study group than in control group (OR= 0.5).

**Conclusion:** Amnioinfusion is a safe and effective procedure in prevention of both maternal & neonatal complications associated with Meconium Aspiration Syndrome.

### INTRODUCTION

Presence of meconium in amniotic fluid is of concern to both obstetricians & paediatricians. Significant rise in neonatal mortality & morbidity occurs when meconium is detected in liquor amnii (1). We, as a country, are already facing very high neonatal mortality rates.

Meconium staining of amniotic fluid occurs in 7-22% of live births across world (2), (3). If this meconium stained fluid is aspirated by the fetus, it may result into much dreaded Meconium Aspiration Syndrome (MAS). MAS occurs in around 1.8 to 18% of all cases of meconium staining of amniotic fluid (4). The reported mortality with MAS is as high as up to 40%, accounting for a large chunk of neonatal mortality & morbidity. Even the incidence of perinatal deaths are reported at a higher rate with MAS.

Thus early detection & prevention of meconium aspiration is essential. Amnioinfusion has been suggested as an intervention that can prevent aspiration of meconium in utero, especially for thick meconium. This study aims to evaluate safety & efficacy of transcervical amnioinfusion towards decreasing the incidence of meconium aspiration syndrome as an entity.

### METHODOLOGY

**Type of Study-** Institute based prospective case control Study

**Study Setting-** Tertiary Care centre in Central India

**Study Period-** October 2006 – October 2007

**Sample Size-** Total- 200 (100-cases, 100 controls)

**Inclusion criteria-**

- Meconium stained liquor found at the time of admission or after AROM
- Gestational age >37wks & <42 wks
- Singleton pregnancy
- Cephalic presentation
- Cervix >3 & <7cm dilated.
- Anticipated time of delivery > 1hr.

**Exclusion criteria-**

- Fetal malformation
- Chorioamnionitis
- Polyhydramnios
- Cord Prolapse
- Cephalopelvic disproportion
- Maternal medical disorders
- Antepartum hemorrhage
- Abnormal FHR pattern requiring immediate operative delivery.

Detailed history & examination (Per Abd & PV) was done. Those patients showing meconium stained liquor & satisfying inclusion criteria were included for study. After informed consent & explanation of the procedure to the patient, transcervical amnioinfusion was carried out in 'cases', while standard treatment was provided to 'controls'. At any stage, if fetal distress was detected, the procedure was abandoned & delivery was expedited.

All the outcomes were measured with standard parameters keeping in mind the generalizability of the study findings.

### OBSERVATIONS

A total of 200 patients were enrolled (100 cases, 100 controls). The cases & controls were matched for maternal age, gravidity, gestational age & cervical examination on admission.

The meconium detection to delivery interval was not statistically different between groups (<2 hrs- 69% cases, 59% controls). The incidence of caesarean section was significantly lower in amnioinfusion group (53%), as compared to controls (66%).

Apgar Scores were better in neonates in case of study group (at 1min: <7 in 18%, at 5 min: <7 in 4%), versus control group (at 1 min: <7 in 28%, at 5 min: <7 in 14%). The odds ratio (OR) were 1.77 (Apgar at 1 min) & 3.9 (Apgar at 5 min) respectively.

### (Table 1 Comes Here)

Meconium Aspiration Syndrome was found to be significantly less likely to happen in study group versus control group (OR= 0.34).

**(Table 2 Comes Here)**

Babies in study group were less likely to have Respiratory Distress (OR= 0.34) & require mechanical ventilation (OR= 0.42) in study group.

**(Table 3 Comes Here)**

Neonatal mortality was reported to be 50% less likely in study group (3 deaths) than in control group (6 deaths) (OR=0.5).

**DISCUSSION-**

Ours is a prospective case control study of 200 patients in labour with meconium stained liquor, aiming to evaluate safety & efficacy of transcervical amnioinfusion in improvement of perinatal outcome.

The application of amnioinfusion, theoretically, seems workable on two grounds. First, amnioinfusion corrects concurrent oligohydramnios & may dilute thick meconium so that the toxic effects of aspiration, should it occur, are diminished. Second, the diminished vagal stimulation due to cord compression after amnioinfusion probably reduces further meconium passage and removes a stimulus for fetal gasping.

Caesarean section was significantly lower in amnioinfusion group (53%), as compared to controls (66%) group in our study. Singh Abha & Magu Dinesh (5) reported 33% of caesarean sections in study group and 57% in control group. Sahu Latika & M. Induvadani (6) reported the incidence of LSCS was 59% in the amnioinfusion group and 74% in the control group.

In the present study, the impact of amnioinfusion on Apgar scores, especially at five minute, was very much favourable, with odds ratio of 3.91. Results of the study were comparable to other studies. Sahu Latika & M. Induvadani (6) reported that Apgar score of <5 at five minutes was seen in 1% of the women in the amnioinfusion group and in 6.6% in the control group. Macri et al (7) reported Apgar score of less than 7 at five minutes in 9% in control group and no cases in study group. Mahomed K et al (8) reported Apgar score of less than 7 at 5 minutes in 8.3% in control group & 2.8% in study group. The present study reported Apgar score of less than 7 at 5 minutes in 14% of control group & 4% of study group, which is statistically significant.

Amnioinfusion was associated with reduction in Meconium Aspiration Syndrome (MAS) in our study. MAS was diagnosed in 18% cases in control group and 7% in study group, the difference being statistically significant at p<0.05. Sadvovsky et al (9) reported MAS in no cases in both control & study group. Macri et al (7) reported MAS in 5.9% cases in control group & no incidence in study group. Mahomed et al (8) reported MAS in 2.7% in control group & 0.6% cases in study group, which is statistically significant.

Our study reported lesser neonatal mortality (3%) in study group than in control group (6%) due to MAS. Mahomed et al (8) showed lower perinatal deaths (3.6%) in cases in comparison to controls (12%) in their study. Sadvovsky et al (9) proposed that there was a significant improvement in neonatal outcome by mechanical dilution of meconium during labour which reduces the intrapartum aspiration of thick meconium.

No maternal complications were reported to be associated with amnioinfusion in the present study; as was reported by Wenstroms & colleagues (10).

**CONCLUSIONS**

The study concludes that transcervical amnioinfusion in cases of meconium stained liquor is a simple, safe and effective procedure in correcting fetal distress and reduces requirement of operative delivery & need of mechanical ventilation. It is greatly effective in improving both maternal & neonatal outcome due to MAS.

**TABLE 1- APGAR SCORE AT ONE MINUTE & FIVE MINUTE**

Sr No	Apgar score	Cases (n= 100)	Controls (n= 100)	Odds Ratio (OR)
1	<b>Apgar score at one minute</b>			
	<7	18 (18%)	28 (28%)	1.77
	>7	82 (82%)	72 (72%)	
2	<b>Apgar score at five minute</b>			
	<7	4 (4%)	14 (14%)	3.91
	>7	96 (96%)	86 (86%)	

(p<0.05)

**TABLE 2- INCIDENCE OF BABIES WITH MECONIUM ASPIRATION SYNDROME (MAS)**

Sr No	Babies with MAS	Cases (n= 100)	Controls (n= 100)
1	Yes	7 (7%)	18 (18%)
2	No	93 (93%)	82 (82%)
	Total	100	100

(p<0.05)

**TABLE 3- INCIDENCE OF RESPIRATORY DISTRESS & REQUIREMENT OF MECHANICAL VENTILATION IN BABIES**

Sr No		Cases (n= 100)	Controls (n= 100)	Odds Ratio
1	<b>Respiratory Distress</b>			
	Yes	14 (14%)	32 (32%)	0.34
	No	86 (86%)	68 (68%)	
2	<b>Requirement of Mechanical Ventilation</b>			
	Yes	7 (7%)	15 (15%)	0.42
	No	93 (93%)	85 (85%)	

(p<0.05)

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