

## ORIGINAL ARTICLE

### ROLE OF TRANSCERVICAL AMNIOINFUSION IN LABOUR COMPLICATED WITH THICK MECONIUM STAINED LIQUOR

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**ABSTRACT: OBJECTIVE:** This is to evaluate the effectiveness of amnio infusion in cases of thick and particulate meconium stained liquor to reduce the incidence of fetal distress and meconium aspiration syndrome in neonates and compare neonatal outcome with control group.

**METHODS:** A prospective comparative case control study was conducted in the Department of Obstetrics and gynecology, Government General Hospital, Kakinada. A total of 100 cases of labour complicated with thick meconium stained liquor were studied of which in 50 cases Transcervical Amnioinfusion was given and remaining 50 cases without amnioinfusion were taken as controls. The statistical analysis of neonatal outcome was done by Chi square test analysis of variance and paired t test. Liquor to reduce the incidence of fetal distress and meconium aspiration syndrome in neonates and compare neonatal. **RESULTS:** Operative interventions for fetal distress were significantly less in infusion group ( $p < 0.01$ ). APGAR scores at 1min, 5min and 10min of  $>7$  were observed in more cases of infusion group with significant difference in control group. Use of resuscitative measures for neonates were relatively more in control group with higher incidence of meconium at and below vocal cords ( $p < 0.01$ ). In amnioinfusion group, admissions in NICU were less ( $p < 0.01$ ) **CONCLUSION:** Transcervical amnioinfusion during labour is a safe, simple, inexpensive and effective procedure in improving the obstetric and perinatal outcome in patients labouring with thick meconium stained liquor

**KEYWORDS:** Amnioinfusion, Meconium Stained liquor, Fetal distress.

**OBJECTIVE OF STUDY:** To evaluate the effectiveness of amnioinfusion in cases of thick and particulate meconium stained liquor to reduce the incidence of fetal distress & meconium aspiration syndrome in neonates and compare neonatal outcome in amnioinfusion group with control group.

**INTRODUCTION:** Meconium passage in to amniotic fluid has been associated with increased perinatal mortality and morbidity especially when mechanical obstruction and chemical inflammation occur as a result of aspiration of meconium in to lower respiratory tract of fetus. The presence of thick meconium in the amniotic fluid of a vertex presentation is considered to be a sign of fetal distress. Passage of meconium is seen in 7-22% of term live births.<sup>1</sup> The presence of meconium in amniotic fluid is of great concern to both the obstetrician neonatologist. This meconium can be drawn in to fetal airway and if thick and tenacious may result in lung collapse, alveolar rupture, interstitial emphysema, Pneumothorax and pneumomediastinum. It can also encourage the growth of microorganisms especially listeria and E.coli. But not thin meconium staining of amniotic fluid associated with poor perinatal outcome. He case fatality rate of

## ORIGINAL ARTICLE

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meconium aspiration is reported to range from 2-40%.<sup>2</sup> This highlights the need for various modalities to treat and prevent meconium aspiration. Current methods include combined obstetric and paediatric approach as described by Carson.<sup>3</sup> The trachea is directly suctioned if meconium is present at the cords. Clinical application of transcervical amnioinfusion was first described by Miyazaki and co-workers<sup>4</sup> as an intrapartum procedure for the relief of variable decelerations. Intrapartum amnioinfusion was later proposed by Wenstrom and Parsons<sup>5</sup> as a way of diluting the meconium to decrease the incidence of meconium aspiration syndrome. Since then, other prospective randomised trials<sup>6,7,8,9</sup> have also demonstrated a significant reduction in meconium below the cords, meconium aspiration syndrome, perinatal death and operative interference in patients receiving amnioinfusion (AI) in meconium stained amniotic fluid (MSAF) as compared to the non-infusion group. This study was undertaken to interfere in first stage of labour complicated with thick meconium stained liquor by infusing warm normal saline in to amniotic cavity and evaluate perinatal outcome.

**MATERIALS AND METHODS:** Prospective case control study was conducted in the department of Obstetrics & Gynaecology, Rangaraya Medical Collage, Kakinada, Andhra Pradesh, in the year 2014. A total of 100 cases of labour complicated with thick meconium stained liquor were studied in which, in 50 cases transcervical amnioinfusion was given & compared with 50 controls with thick meconium, in labour, after taking consent. Laryngoscopic examination of vocal cords was done to know if there is any meconium in the trachea. If meconium is present, aspiration of trachea is done. Stomach wash was given to neonate. Neonate is observed for any evidence of respiratory distress. If necessary NICU admission was done and followed.

**INCLUSION CRITERIA:** All women in active labour with thick meconium stained liquor, Term gestation, Singleton pregnancy, Vertex presentation.

**EXCLUSION CRITERIA:** Multiple pregnancy, Malpresentations, APH, Chorioamnionitis, Preterm labour, CPD.;

**PROCEDURE:** A Careful history was taken about age, parity, LMP, EDD and complete obstetric history. Thorough physical examination was done to know general condition of the patient. Obstetrical examination was done to know fundal height, lie, and presentation of fetus. Uterine contraction and relaxation. Auscultation of fetal heart was done every half an hour during first stage and every 5mins during the second stage. Pelvic examination was done to know cervical dilation and effacement, station of vertex and adequacy of pelvis for vaginal delivery. In test group under full aseptic conditons warmed normal saline was infused into uterine cavity by nelton's catheter introduced transcervically about 15cm above the foetal vertex. A bolus of 600-800 ml was infused @15ml/min and infusion maintained @3ml/min till the second stage of labour. Labour was monitored by partogram. Paediatrician informed with arrangements for neonatal resuscitation. Soon after head delivery thorough suction of oropharynx & nasopharynx was done. Chest splinting maintained to prevent meconium aspiration. 1, 5 and 10 min APGAR scores were noted. Laryngoscopic examination of vocal cords was done to know if there is any

## ORIGINAL ARTICLE

meconium in the trachea. If meconium is present, aspiration of trachea is done. Stomach wash was given to neonate. Neonate is observed for any evidence of respiratory distress. If necessary NICU admission was done and followed up.

**RESULTS:** A total of 50 cases in study group and another 50 cases in control group enrolled in the study were subjected to z test (test of proportions) for statistical significance. Meconium was detected at 3-4cms of cervical dilatation on an average in both groups Amnioinfusion to delivery interval was on an avg. 3.3hrs Meconium infusion to delivery interval was 3.91hrs on avg. in control groups. On an average 794 ml of normal saline was infused Intervention for fetal distress was done in 26 cases (52%) in control group as compared to 3 cases 6% in infusion group. ( $p < .01$ , significant) 1min APGAR  $>7$  was in 88% Of infusion group & 46% in control group ( $p < .01$ , significant) 5 min APGAR  $>7$  was in 99% of infusion group & 66% in control group ( $p < .01$ , significant) Incidence of meconium below vocal cords was 6% in infusion group & 40% in controls. ( $p < .01$ , significant) Respiratory distress & nicu admission was present in 56% cases of control group as compared to 4% in infusion group ( $p < .01$ , significant) In infusion group one baby developed meconium aspiration. Syndrome (2%), which recovered on 3<sup>rd</sup> day. In control group 16% cases developed MAS of which 12% recovered. Incidence of MAS was 16% with mortality of 25% ( $p < .01$ , significant). Pernatal mortality was 6% in control group compared to 0% in study group ( $p < .05$ , significant)

	Study (n=50)	Control (n=50)
Mean age in years	19yrs	20yrs

**Table 1: Mean age in years**

	Study (n=50)	Control (n=50)
Primi gravida	30(60%)	30(60%)
Multigravida	20(40%)	20(40%)

**Table 2: Parity**

Before infusion quality of liquor		After infusion quality of liquor	
Thick	20(40%)	Thin 5 (10%)	
		Clear 15(30%)	
Moderately thick	30(60%)	Thin 6(12%)	
		Clear 24(48%)	

**Table 3: Dilution Effect on Liquor after Amnio Infusion in Study Group**

	Study Group	Control Group
Vaginal Delivery	42(84%)	24(48%)
Outlet Forceps	07(14%)	14(28%)
Midlow Forceps	00	00
Cesarian Section	01(2%)	12(24%)

**Table 4: Mode of Delivery**

## ORIGINAL ARTICLE

		<b>Study</b>	<b>Control</b>	<b>p-value</b>
1-Minute	<7	6(12%)	27(54%)	<0.01
	>7	44(88%)	23(46%)	<0.01
5-Minutes	<7	3(6%)	17(34%)	<0.01
	>7	47(94%)	33(66%)	<0.01
10-Minute	<7	0	13(26%)	>0.01
	>7	50(100%)	37(74%)	>0.01

**Table 5: Apgar Score**

<b>Technique</b>	<b>Study</b>	<b>Control</b>
Suction	50(100%)	50(100%)
O2 inhalation	12(24%)	32(64%)
Endotracheal aspiration	4(8%)	17(34%)
Bag and mask	0	12(24%)
Endotracheal intubation	0	10(20%)

**Resuscitation Technique used immediately after Delivery**

	<b>Study</b>	<b>Control</b>
Present	2(4%)	28(56%)
Absent	48(96%)	22(44%)

**Respiratory Distress at Birth**

**DISCUSSION:** The incidence of meconium stained liquor occurs in 10-15% of deliveries. The syndrome of MAS occurs in 20-30-% of cases complicated by meconium stained liquor. MAS accounts for 2% of perinatal death. Several studies were conducted to evaluate the role of intrapartum amnioinfusion in reducing the risk of MAS during labour and delivery. Furthermore, in the group which received amnioinfusion, babies had better Apgar scores, fewer babies had respiratory distress and meconium below the vocal cords, fewer babies needed NICU admission for respiratory distress and babies needing mechanical ventilation were significantly reduced. These findings were supported by the studies done by Lathika et al.<sup>10</sup> and Rathorea et al.<sup>11</sup> It was found to be effective in reducing the perinatal mortality and morbidity in neonates born with meconium stained liquor. mnioinfusion improves the perinatal outcome by two mechanisms, mechanical effect and dilution effect of meconium stained amniotic fluid. It also helps decreasing fetal acidemia and cord compression. Amnioinfusion was useful in significantly improving the quality of liquor i.e. thick meconium stained liquor became completely clear in 83.25% cases and thin in 16.5% cases (p<.01 significant). Amnioinfusion positively helps in washing out meconium from amniotic cavity as shown in table 1. A systematic review done by Hofmeyr et al.<sup>12</sup> evide showed that in clinical settings with standard peripartum surveillance, there is no nce to show that amnioinfusion reduced the risk of MAS or reduced the incidence of caesarean section, but in clinical settings with limited peripartum surveillance where complications of MSAF are common,

## ORIGINAL ARTICLE

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AI reduces the risk of MAS. Saline lavage could thin out the tenacious meconium and assist in its removal. AI is a simple procedure in which normal saline is infused into the uterine cavity.<sup>13</sup>

**CONCLUSION:** Thick meconium stained liquor is a cause of concern to both the obstetrician and paediatrician as it results in increased morbidity to the mother as a result of operative interference and increased morbidity and mortality to the baby due to meconium aspiration. This study has demonstrated that amnioinfusion in cases of thick meconium stained liquor improves the neonatal outcome by diluting the meconium in amniotic fluid.

The Apgar scores are improved; there is decreased incidence of fetal distress, meconium below the vocal cords and meconium aspiration syndrome. It also reduces the operative intervention for fetal distress. Further, it does not cause any increase in maternal morbidity. Thus, transcervical amnioinfusion is an effective, simple and safe preventive measure which could be routinely incorporated in the management protocol of labour complicated by thick meconium stained amniotic fluid and may result in better fetal outcome and lower rates of caesarean section.

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## ORIGINAL ARTICLE

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