# IS AMNIOINFUSION EFFECTIVE ENOUGH TO REDUCE PERINATAL MORTALITY?

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## ABSTRACT

***Objective:*** *To assess the effects of amnioinfusion for meconium stained liquor on reducing perinatal death.*

***Material and Methods:*** *This case control study was conducted in Kalsoom Maternity hospital, Peshawar on singleton pregnancies with cephalic presentation, >37 weeks gestation and meconium stained liquor at admission or during labor, randomized in two groups. Group 1 (study group) received amnioinfusion (normal saline 500mls at room temperature) over a period of 30 minutes at a rate of 10-20 mls/min. Group 2 (control group) did not receive such treatment. Fetal heart monitoring at every 10-15 minutes along with progress of labour plotted on a partogram was recorded.*

***Results:*** *Out of 82 cases, 1 breech and 2 premature were excluded so 79 were left for the study. All were with cephalic presentation and gestation >37 weeks in 73.41% cases and postdates in 26.5% cases.*

*In Group 1 (n=52), 36 (69.2%) had normal vaginal delivery (NVD), 4(7.7%) had outlet forceps delivery, 12(23.1%) had vacuum vaginal delivery and cesarean section rate was 0%. Two (3.8%) newborns were referred to nursery with 1 (1.9%) early neonatal death.*

*In Group 2 (n=27), 6 (22.2%) had NVD, 11(40.7%) delivered with outlet forceps, 10(37.1%) had vacuum vaginal delivery and no cesarean section. Twelve (44.4%) babies were referred to nursery with 2 (7.4%) early neonatal deaths.*

***Conclusion:*** *Amnioinfusion is associated with improvements in perinatal outcome, particularly in settings where facilities for fetal surveillance are limited. The technique appears to be safe, simple and economical.*

***Key Words:*** *Meconium Stained Liquor, Amnioinfusion, Perinatal Mortality.*

## INTRODUCTION

Amnioinfusion is a relatively new technique with several applications. The two most common applications are transcervical and transabdominal. The first procedures aims to prevent or treat severe variable decelerations in fetal heart rate related to oligohydromnios or to dilute thick meconium of the amniotic fluid.[1] Amnioinfusion was first described in 1976. The[2] passage of thick meconium in utero, puts the neonate at risk for meconium aspiration syndrome (MAS). Meconium aspiration syndrome develops in 1.8 to 18 percent of infants delivered from meconium-stained amniotic fluid. A[3] study shows that 5% of infants born through meconium stained amniotic fluid (MSAF) develop meconium aspiration syndrome. A[4]spiration of meconium is considered an intrauterine event, although it can also occur during delivery with the initial breaths of the baby. Ānother study has reported meconium aspiration syndrome in 2 percent of all perinatal deaths.[6] The risk of meconium aspiration is high in patients with thick meconium, particularly when it is associated with episodes of fetal hypoxemia. Thin meconium is not associated with an increased perinatal mortality rate or with an increased incidence of meconium aspiration syndrome. Therefore, any mechanism by which thick meconium can be converted to thin meconium in the already potentially compromised fetus is postulated to have a positive affect on neonatal outcome[7,8] The results of a meta-analysis demonstrated a reduction in heavy meconium staining, meconium aspiration syndrome and the need for neonatal ventilation.[9] Present study was therefore designed as to assess the effects of amnioinfusion for meconium stained liquor on

## GRADES OF MECONIUM

| Grades of Meconium | Group 1 (n=52) | Group 2 (n=27) |
|---|---|---|
| Grade I (n=21) | 8 (15.4%) | 13 (48.2%) |
| Grade II (n=40) | 28 (53.8%) | 12 (44.4%) |
| Grade III (n=18) | 16 (30.8%) | 2 (7.4%) (fully dilated) |

Table 1

reducing perinatal death.

## MATERIAL AND METHODS

This hospital based case control study of 79 patients with meconium stained liquor, was carried out from 1 of st January to 31 of December 2000 at Kalsoom Maternity Home Peshawar. Total deliveries during the study period were 2633. Cases were randomly selected and divided into two groups, Group 1(study group) in which amnio-infusion was done while patient in Group 2 did not receive such treatment (control). All deliveries with cephalic presentation, more than 37 weeks gestation and meconium stained liquor at admission or during labor were included. Out of 82 cases, 2 were premature and one was Breech so they were dropped out, only 79 cases were included in the study, 52 in group 1 and 27 in group 2. Detailed history, examination and labor findings were then recorded. Meconium was clinically defined as a green viscous fluid that consists of fetal gastrointestinal secretions, cellular debris, mucus, blood, lanugo, and vernix. Procedure used was Normal Saline 500mls, at room temperature, over a period of 30minutes at a rate of 10-20mls/ min and fetal heart recorded at every 10-15 minutes, uterine tone and the frequency of contractions assessed by palpation along with progress of labor plotted on a partogram.

## RESULTS

Out of 82 cases, 2 were premature and one was Breech so they were dropped out and only 79 cases were included in the study. All were with cephalic presentation and gestation more then 37 weeks (73.41%), while 26.5% were postdates. Around 44.3% were primigravidas while 55.6% were multigravidas.

In majority of patients meconium was found to be of moderate intensity, i.e.; 53.8% (n=28/52) in amnioinfusion group and 44.4% (n=12/27) in control group (Table 1). Pregnancy induced hypertension/Preeclampsia was cause of meconium stained liquor in 22.78%, 5.06% were due to cord around neck while 1. 26% were IUGR.

In our study, two patients with grade III meconium did not receive amnioinfusion because of lack of time as they were fully dilated and vacuum or outlet forceps delivered them. Babies were born with APGAR 6, suction done and were not referred to nursery.

**Group 1 (study group):**

Out of 52 cases recruited in this group, 36 (69.2%) had normal vaginal delivery, 4 (7.7%) had outlet forceps delivery, 12 (23.1%) had vacuum vaginal delivery and cesarean section rate was 0% (Table 2). Five minutes APGAR score was >7 in 44 (84.6%) cases (Table 3). Only two (3.8%) newborns were referred to nursery with 1 (1.9%) early neonatal death (Table 4).

**Group 2 (control group):**

Out of 27 cases where no amnioinfusion was done, 6 (22.2%) had normal vaginal delivery, 11 (40.7%) delivered with outlet forceps, 10 (37.1%) had vacuum vaginal delivery and again no cesarean section ( Table 2). Five minutes APGAR score was >7 in 11 (40.74%) cases ( Table 3). Twelve (44.4%) babies referred to nursery with loss of 2 (7.4%) babies. One (3.7%) was still birth and 1 (3.7%) expired on 3 rd day of life in nursery, the cause was Meconium aspiration syndrome. So total mortality in group 2 was 7.4%.

## DISCUSSION

The result of our study shows that the passage of thick meconium in utero puts the neonate at risk of meconium aspiration syndrome, while thin meconium is not associated with increased perinatal mortality or an increase incidence of meconium aspiration. Thick meconium should always be considered as a marker for possible fetal compromise and should lead to careful evaluation of fetal wellbeing. [10]

Meconium is a green viscous fluid that

## MODE OF DELIVERY IN THE 2 GROUP

| Mode of Delivery | Group 1 (n=52) | Group 2 (n=27) | Total (n=79) |
|---|---|---|---|
| Normal Vaginal Delivery | 36 (69.2%) | 6 (22.2%) | 42 (53.2%) |
| C/Section | Nil | Nil | Nil |
| Outlet Forcep Delivery | 4 (7.7%) | 11 (40.7%) | 15 (19%) |
| Vaccum Delivery | 12 (23.1%) | 10 (37.1%) | 22 (27.8%) |

Table 2

## FIVE MINUTES APGAR SCORE

| APGAR Score | Group 1 (n=52) | Group 2 (n=27) |
|---|---|---|
| < 5 | 1 (1.9%) | 8 (29.63%) |
| 5----7 | 7 (13.5%) | 8 (29.63%) |
| > 7 | 44 (84.6%) | 11 (40.74%) |

Table 3

consists of fetal gastrointestinal secretions, cellular debris, mucus, blood, lanugo, and vernix. It first appears in the fetal ileum between 10 and 16 weeks' gestation. Passage of meconium in utero with staining of the amniotic fluid occurs in 12 to 16% of all deliveries and is often not associated with fetal distress or neonatal death. [11-12] Meconium passage is rare before 34 weeks gestation. [13]

In a study by Norwitz ER et al [14] showed that post-term pregnancy complicates about 10% of all gestations and is associated with increased risk to both fetus and mother. In our study 73% were between 37-40 weeks while 26.5% were between 40-42 weeks, while no case reported beyond 42weeks. A study by Yoder BA et al [15] showed that reduction in post-term delivery is the most important factor in reducing meconium aspiration syndrome (from 5.8% to 1.5%).We observed that the presence of meconium is associated with a higher risk of prolonged labor, fetal distress, and low APGAR scores. Xu H et al[16] showed that amnioinfusion reduces the risk of meconium aspiration syndrome especially in clinical settings with limited peripatum surveillance. Results of Moodley J et al[17] showed that amnioinfusion is effective for improving perinatal outcome of pregnancies complicated by meconium stained liquor in labour as well as decrease in caesarean sections for fetal distress. Sood M et al [18] in their study showed that amnioinfusion resulted in relief of decelerations in 75% of cases,85% delivered vaginally with better neonatal outcome. A study by Ziadeh-SM et al[25] showed that perinatal mortality increases from 2/1000 births with clear amniotic fluid to 10/1000 with meconium. A study by Ashfaq F et al [20] shows a low rate of cesarean section, no perinatal mortality and reduce risk of meconium aspiration syndrome in amnioinfusion group. In present study 84.6% in group 1 who received amnioinfusion had APGAR more than 7, our findings correlates with that of Das AK et al [21] and Rathor AM et al[22]. Abdel-Aleem H et al[23] observed that amnioinfusion is a simple and effective intervention that reduces the rate of cesarean section. Few acute events have been attributed to amnioinfusion. Isolated cases of umbilical cord prolapsed. [24,25] Iatrogenic polyhydromnios and elevated intrauterine pressure during amnioinfusion leading to fetal bradycardia ,uterine scar disruption [26] and five cases of amniotic fluid embolism have been reported. [27] Two maternal deaths were observed in a study reported by Dourijan G. [28] Such acute events were observed in our study.

## PERINATAL OUTCOME

| Perinatal Outcome | Group 1 (n=52) | Group 2 (n=27) |
|---|---|---|
| Nursery admission | 2 (3.8%) | 12 (44.4%) |
| Mortality | 1 (1.9%) | 2 (7.4%) |

Table 4

## CONCLUSION

Amnioinfusion is associated with improvements in perinatal outcome, particularly in settings where facilities for fetal surveillance are limited. The technique appears to be safe, simple and economical. However large randomized controlled trials on amnioinfusion are needed to see the reduction in c/section rate and other outcome measures.

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