Original Research Article

A study of effect of intrapartum amniotic infusion in meconium stained liquor on perinatal outcome

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Abstract

Introduction: Pregnancy and child bearing are attended by certain risks to the mother as well as the fetus. The aim is to improve our management of the high-risk situations and optimize the outcome of pregnancy. The presence of thick meconium in labour particularly in association with post term pregnancy, oligo or anhydramnios and poor fetal growth has been associated with an increased risk of fetal acidemia which then increases the risk of meconium aspiration. Amnioinfusion is relatively a recent procedure introduced in the technique of fetal medicine **Aims and Objectives**: Study of effect of intrapartum amniotic infusion in Meconium stained Liquor on Perinatal Outcome **Methodology**: With approval from institutional ethical comoitee The present case control study was conducted from 1st March 2003 to 30th 2004 March in the department of obstetrics and gynecology, Silchar Medical College and Hospital, Assam. Woman in labour at 36 to 42 weeks of gestation, with singleton fetus in cephalic presentation and moderate or heavy meconium staining of the amniotic fluid were included in the study. A total of 200 cases were undertaken in the clinical study **Result:** Apgar score at 5 min < 6, Meconium below vocal cord (MBVC) Resuscitation at birth (O_2 / E.I) were significantly higher in control groups as compared to study group. While NICU admission, MAS, Neonatal jaundice, Neonatal septicemia, Neonatal death were also higher in the control but were not significantly higher than the study group. The common causes of Neonatal deaths were MAS, Neonatal septicemia, Stillbirths. **Conclusion:** The Meconium aspiration syndrome remains an important cause of neonatal morbidity and mortality. Amnioinfusion seems to be one of the possible solutions to this problem. It is readily apparent that amnioinfusion significantly decreased Fetal Distress, Resuscitation required.

Keywords: Amnioinfusion, MAS (Meconium Stained Liquor).

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INTRODUCTION

Pregnancy and child bearing are attended by certain risks to the mother as well as the fetus. The aim is to improve our management of the high-risk situations and optimize the outcome of pregnancy. The presence of thick meconium in labour particularly in association with post term pregnancy, oligo or anhydramnios and poor fetal growth has been associated with an increased risk of fetal acidemia which then increases the risk of meconium aspiration. Amnioinfusion is relatively a recent procedure introduced in the technique of fetal medicine. It involves the insertion of a sterile physiologic solution into the uterine cavit. Its application focuses on two different methods: "Transabdominal" and "Transcervical". Amnioinfusion was first described in 1976[1] using a rhesus monkey model, the authors reported that variable deceleration occurred when amniotic fluid was removed from the uterine cavity and resolved when it was replaced. The first major investigation on this subject was published in 1983, when Miyazaki and Taylor reported on the benefits of infusing saline solution through an intrauterine pressure catheter to relived variable decelerations during labour. Amnioinfusion may also be accomplished transabdominally for a variety of indications, including fetal anatomic assessment and evaluation of oligohydramnios. Various studies have shown that amnioinfusion increases the amniotic fluid index, relives variable decelerations in many instances, and improves umbilical artery and venous pH, dilutes thick meconium-stained amniotic fluid and reduces the operative delivery for fetal distress. Meconium is detected

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in amniotic fluid in 8% to 16% of all deliveries and is associated with increased perinatal mortality and morbidity, cesarean section for fetal distress, low Apgar scores, neonatal acidosis and meconium aspiration syndrome [2]. Pharyngeal suction and tracheal aspiration improves neonatal management, but does not abolish the meconium aspiration syndrome since it sometimes occurs before delivery. Meconium aspiration syndrome has been reported to occur in 1% to 3% of the newborn infants following meconium staining of the amniotic fluid and has not been eliminated by the policy of suctioning the infant's airway at delivery[3] The presence of meconium in the amniotic fluid is associated with increased neonatal morbidity and mortality. The mechanism of this association and a cause and effect relationship is still unclear. The neonatal mortality associated with this syndrome is as high as 28%[4].The clinical application of trans cervicalamnioinfusion was first described by Miyazaki and coworkers[5] as an intrapartum procedure for the relief of variable decelerations. Later Nageotte *et al* in 1985 applied this prophylactic measure to prevent variable decelerations in patients with preterm membrane rupture. With the objectives of reducing the morbidity and mortality in the fetus complicated by thick meconium stained liquor during labour, the present study "Role of Intrapartum Amnioinfusion in Meconium Stained Liquor and Perinatal Outcome" was undertaken in the department of obstetrics and gynecology, Silchar Medical College and Hospital.

AIMS AND OBJECTIVES

Study of effect of intrapartum amniotic infusion in Meconium stained Liquor on Perinatal Outcome

MATERIAL AND METHODS

With approval from institutional ethical comoitee. The present case control study was conducted from 1st March 2003 to 30th 2004 March in the department of obstetrics and gynecology, Silchar Medical College and Hospital, Assam. Woman in labour at 36 to 42 weeks of gestation, with singleton fetus in cephalic presentation and moderate or heavy meconium staining of the amniotic fluid were included in the study. A total of 200 cases were undertaken in the clinical study. The cases were divided broadly into two groups: GROUP A: The study group included 100 patients with term pregnancy in labour with meconium stained amniotic fluid that received intrapartumamnioinfusion (AI). GROUP B: The control group included 100 patients with term pregnancy in labour with meconium stained amniotic fluid that received standard obstetric care without intrapartumamnioinfusion (AI).

RESULT

Table 1: Perinatal outcome in the both study and control group

Perinatal Outcome measures	Study group N =100 N %	Control group N =100 N %	p-value
Apgar score at 5 min < 6	10 10%	26 26%	Z=2.95,p<0.01
Meconium below vocal cord (MBVC)	9 9%	18 18%	Z=2.10,p<0.05
Resuscitation at birth (O_2 / E.I)	16 16%	32 32%	Z=2.65,p<0.01
NICU admission	11 11%	21 21%	Z=1.94.p>0.05
MAS	2 2%	8 8%	Z=0.9305,p>0.05
Neonatal jaundice	7 7%	4 4%	Z=1.35,p>0.05
Neonatal septicemia	1 1%	4 4%	Z=1.023,p>0.05
Neonatal death	3 3%	6 6%	Z=1.023,p>0.05

Fropm Table 1. Apgar score at 5 min < 6, Meconium below vocal cord (MBVC) Resuscitation at birth (O_2 / E.I) were significantly higher in control group as compared to study group. While NICU admission, MAS, Neonatal jaundice, Neonatal septicemia, Neonatal death were also higher in the control but were not significantly higher than the study group.

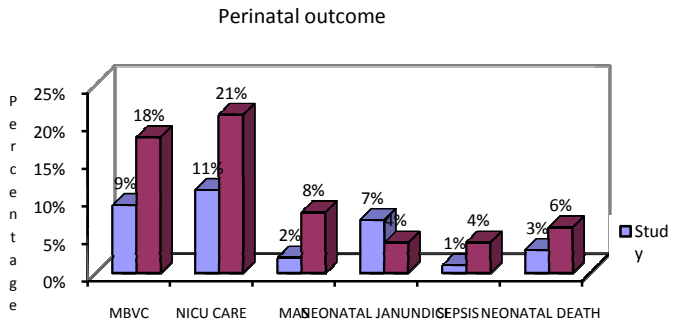

Figure 1: Perinatal outcome measures

Routine antibiotic coverage was given to both the groups at the time of admission. Also it was noted that these cases were admitted as emergency patients with no history of antenatal care. Some of the cases were outside manipulated. There was 3% (3 of 100) neonatal death in the amnioinfusion group compared with 6 of 100 (6%) in the control group. The patients who had neonatal death had history of prolonged labour with time of membrane rupture more than 6 hours prior to admission and the mean duration of meconium stain amniotic fluid and delivery interval was 7 ± 3 hours. The perinatal mortality rate in the present study was in the amnioinfusion group compared with in control group. The common causes of Neonatal deaths were MAS, Neonatl septicemia, Stillbirths.

Table 2: Showing the causes of neonatal deaths

Causes	Study group (A)	Control group (B)
MAS	1 (1%)	2 (2%)
Neonatal septicemia	1 (1%)	2 (2%)
Stillbirths	1 (1%)	2 (2%)

DISCUSSION

The APGAR scores at one minute in both the study and the control groups were compared with similar studies. In our study 85% (85 of 100) infants had Apgar score of six or more at one minute in the amnioinfusion group compared with 67% (67 of 100) in control. 15 of 100 (15%) infants had Apgar scores of less than six at one minute in the amnioinfusion group compared with 33 of 100 (33%) in control. Mahomed *et al* (1998)[15] reported 2.5% incidence of one minute Apgar score 4 or less in the amnioinfusion group compared with 5.3% in control group (RR=0.46). Whereas Strong *et al* (1990) reported 0% infants in the amnioinfusion group with one minute Apgar score less than 7 compared with 10% in control group. Apgar score at 5 – minuteIn the present study 90% (90 of 100) infants had 5-minute Apgar score of six or more in the amnioinfusion group compared with 74% (74 of 100) in control group. 10% (10 of 100) infants had Apgar score of less than six at five minutes in the amnioinfusion group compared with 26% (26 of 100) in control. Macri *et al*, (1992) [12], Keith *et al* (1993)[8], Usta *et al*(1995)[9] were having the similar results. It was observed that the 5-minute Apgar score was better in the amnioinfusion group compared with control group in most of the similar trials and it was statistically significant. Resucitation Required At Birth: All the neonates received routine neonatal resuscitation with cleaning, oropharyngeal suctioning in both the study and the control groups. Apart from routine resuscitation at birth 16% (16 of 100) in the study group required endotracheal intubations / Bag and mask compared with 32% in control. Keith *et al* (1993)[8] Uhing *et al* (1993)[7], Usta *et al* (1995)[9]Puertas *et al* (2001)[10]. It is observed that the requirement of neonatal resuscitations at birth in the amnioinfusion group is significantly lower than the control group.Meconium Below Vocal Cords (MBVC): In the present study 9% (9 of 100) in the amnioinfusion group had meconium below the vocal cords compared with 18% (18 of 100) in control group. Puertas *et al* (2001)[10] Latika *et al* (2003)[11]. In the incidence of meconium below the vocal cords in the amnioinfusion group was lower than in control group that is statistically is significant. Other studies also show similar observations. Meconium Aspiration Syndrome: In the present study the incidence of meconium aspiration syndrome is 2% in the amnioinfusion group compared with 8% in control. It was observed that the similar trials show lower incidence of MAS in the amnioinfusion group than in control. Our present study shows similar results with Hofmeyr *et al* (1996)[14] and Mahomed *et al* (1998)[15]. Macri *et al*, (1991)[12] found zero percent infants with MAS in the amnioinfusion group compared with 5.9% in control (OR=0.31).1991 Keith *et al* (1993)[8]Cialone *et al* (1994)[13], Hofmeyr *et al* (1996)[14], Latika *et al*, (2003)[11].Were having the same results. Nicu Admission: 11 % (11of 100) infants in the amnioinfusion group required NICU care for all causes compared with 21 % (21 of 100) in control group. The present study was compared with other similar studies. The table no 11 show the neonatal intensive care unit admission in both the study and control groups compared with other studies. The neonatal intensive care unit (NICU) rates in the present study are comparable with other similar studies, which is statistically significant. Other studies have shown similar NICU admission rates. Hofmeyr *et al* (1998)[14] reported a very low NICU admission rate of 1.8% in the amnioinfusion group versus 2.5% in control (RR=0.75).Neonatal Septicemia: In the present study 1% (1of 100) had neonatal sepsis in the amnioinfusion group compared with 4 % (4 of 100) in control. The table no 12 show the comparison of neonatal septicemia in the present study with other similar studies. The various studies show that the incidence of neonatal sepsis was not significantly difference in both the amnioinfusion and control. Strong *et al*, 1990 has reported zero percent neonatal sepsis in the control group compared with 3.5% in study group.Cialone *et al* (1994)[13]Usta *et al* (1995)[9] were having the same results. Perinatal Death: The perinatal mortality rate in the present study was The table no 13 show the perinatal mortality rate (PNMR) in comparison to present study. Hofmeyr *et al* [14] 1996Mahomed *et al*[15] Latika *et al*[11] .The perinatal deaths of our study are comparable to similar studies.

CONCLUSION

The Meconium aspiration syndrome remains an important cause of neonatal morbidity and mortality. Amnioinfusion seems to be one of the possible solutions to this problem. It is readily apparent that amnioinfusion significantly decreased Fetal Distress, Resuscitation required. Amnioinfusion is a promising new technique in the field of fetal medicine with important implications for the care of the pregnant woman. Attention should be directed towards ensuring that the evidence of effectiveness of amnioinfusion in specific circumstances is translated into clinical practice, and that the remaining unanswered questions are addressed by appropriately sized clinical trials.

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