

Meconium Aspiration Syndrome in Meconium Stained Babies

Muhammad Khalid Masood,¹ Saadia Sharif,² Naeem Akram Butt³

Abstract

Objective: To find out frequency of meconium aspiration syndrome in meconium stained babies. To find out association of certain risk factors with development of MAS.

Method: This was a cross sectional study. All term neonates delivered through meconium stained amniotic fluid during the study period of six months, in Holy Family Hospital were included in the study by non-probability convenient sampling. They were admitted in neonatal unit and were observed for the development of MAS. Risk factors that were studied, included maternal parity, prolonged rupture of membranes more than 16 hours, mode of delivery, fetal distress, weight of the babies, meconium stained vocal cords and APGAR score of less than 7 at 5 minutes.

Results: One hundred twenty six babies were included in the study. Out of these, 10 (7.9%) developed MAS and 2 (20%) out of 10 babies of MAS died while rests were discharged after treatment.

Conclusion: 7.9% meconium stained babies developed MAS with 20% mortality. Important risk factors

Senior Registrar, Services Hospital, Lahore associated with development of MAS were found to be delivery through cesarean section, fetal distress, meconium stained vocal cords and low APGAR score at 5 minutes.

Introduction

Pakistan has a high infant and perinatal mortality rate. Most of these deaths occur in first month of life and are caused by birth related problems. Meconium aspiration syndrome is one of the leading causes of death.¹ Meconium aspiration syndrome (MAS) is defined as respiratory distress that develops shortly after birth with a history of meconium stained amniotic fluid and radiological evidence of aspiration pneumonitis.²

Meconium is a viscous, green, sticky substance and is the first intestinal discharge of the newborn baby. Passage of meconium in utero with staining of amniotic fluid occurs in 11 – 13% of all deliveries. MAS develops in 3 – 6% of meconium stained babies and being one of the leading causes of perinatal mortality, leads to 10 – 18% mortality in babies with MAS.³

Any intra uterine stress may cause in utero passage of meconium into amniotic fluid. Meconium stained amniotic fluid (MSAF) occurs mostly in post term babies, in prolonged rupture of membranes, lower segment caesarean section and non-booked primigravida mothers.^{4,5}

Identification of post term pregnancy and perinatal asphyxia is important in prevention of MAS.³ MAS can cause complications like mechanical obstruction of airways, pneumonitis, surfactant inactivity and per-

Masood M.K.¹
Associate Prof of Pediatrics
King Edward Medical University, Lahore

Sharif S.²
Senior Registrar, Services Hospital, Lahore

Butt N.A.³

sistent pulmonary hypertension of the newborn. Respiratory disease in these infants is a combination of aspiration, asphyxia and pulmonary hypertension. Fetal risk factors for developing respiratory symptoms are thick meconium, fetal distress, APGAR score less than 7 at 5 minutes and meconium staining of vocal cords.^{3,6}

All the neonates born through meconium stained amniotic fluid are at risk to develop MAS and may lead to high mortality and morbidity.⁴

In Pakistan the exact magnitude of the problem is not known due to lack of statistical data on the subject as it is not studied locally. This study analyses the frequency of MAS in meconium stained babies. Besides we have tried to identify risk factors in mothers as well as in babies which predispose to development of MAS. As some of the factors may be preventable and proper identification and early management of the problem may reduce the risk of meconium staining and subsequent aspiration. Thus associated mortality and morbidity may also reduce.

Material and Method

This is a hospital based study and carried out at Holy Family Hospital Rawalpindi which is a 450 bedded hospital with a well – established neonatal unit. Non probability convenience technique was followed and all the babies with history of meconium stained amniotic fluid were included in the study. This study was carried out for 6 months from March 2006 to august 2006. Only exclusion criteria was presence of any congenital anomaly.

It was a cross sectional study using observational checklist and record review. Histories of mothers regarding pregnancy were taken either directly or through record to identify risk factors. Record of labor monitoring was noted including cardiotocographs. All the deliveries complicated by meconium stained amniotic fluid were routinely attended by pediatric residents with fair capability to perform tracheal intubation. Oral suction by obstetrician was done in all cases before handling the babies over to pediatric resident.

Resuscitation measures were taken as and when necessary and study did not interfere with the routine care at birth. Oropharyngeal inspection and suctioning through direct laryngoscopy was carried out and if meconium was found in laryngeal inlet, tracheal intubation and suction was done. In vigorously crying babies oropharyngeal suction was considered ade-

quate. APGAR score was assigned independently. The events at birth were recorded and babies were followed for the rest of the course in the nursery for a minimum of 24 hours before discharge.

Gestational age was assessed by Modified Dubowitz Scoring System. Babies were weighed. Portable chest x-rays were carried out in all babies. Other routine investigations including metabolic or septic work-up was carried out as otherwise indicated.

Observations were carried out at 0, 6, 12 and 24 hour of life and babies having following features were labeled as MAS, respiratory rate more than 60 / minutes, cyanosis, grunting, retractions and radiological evidence in form of patchy infiltrates , hyperinflation, air leaks etc.

Factors that were studied to find out association with MAS included maternal parity, ruptured membranes for more than 16 hours, mode of delivery, evidence of fetal distress in form of CTG changes or bradycardia, weight of the babies, presence of meconium stained vocal cords and APGAR score less than 7 at 5 minutes. Data was analyzed using SPSS 10.0 software.

Results

Total babies included in the study were 126. Out of these babies 27 (21.4%) developed respiratory symptoms and 99 (78.6%) remained asymptomatic.

Frequency of Meconium Aspiration Syndrome

Cases	Frequency	Percent
MAS	10	7.9%
No MAS	116	92.1%
Total	126	100.0

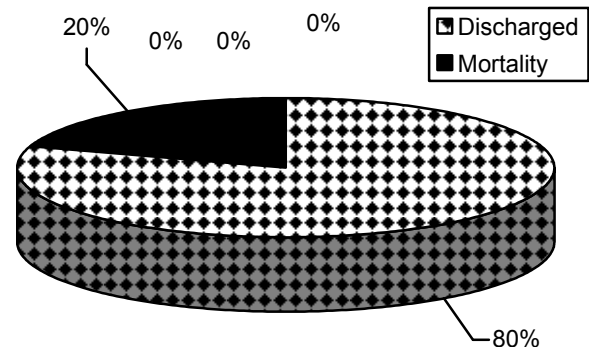


Fig. 1: Mortality

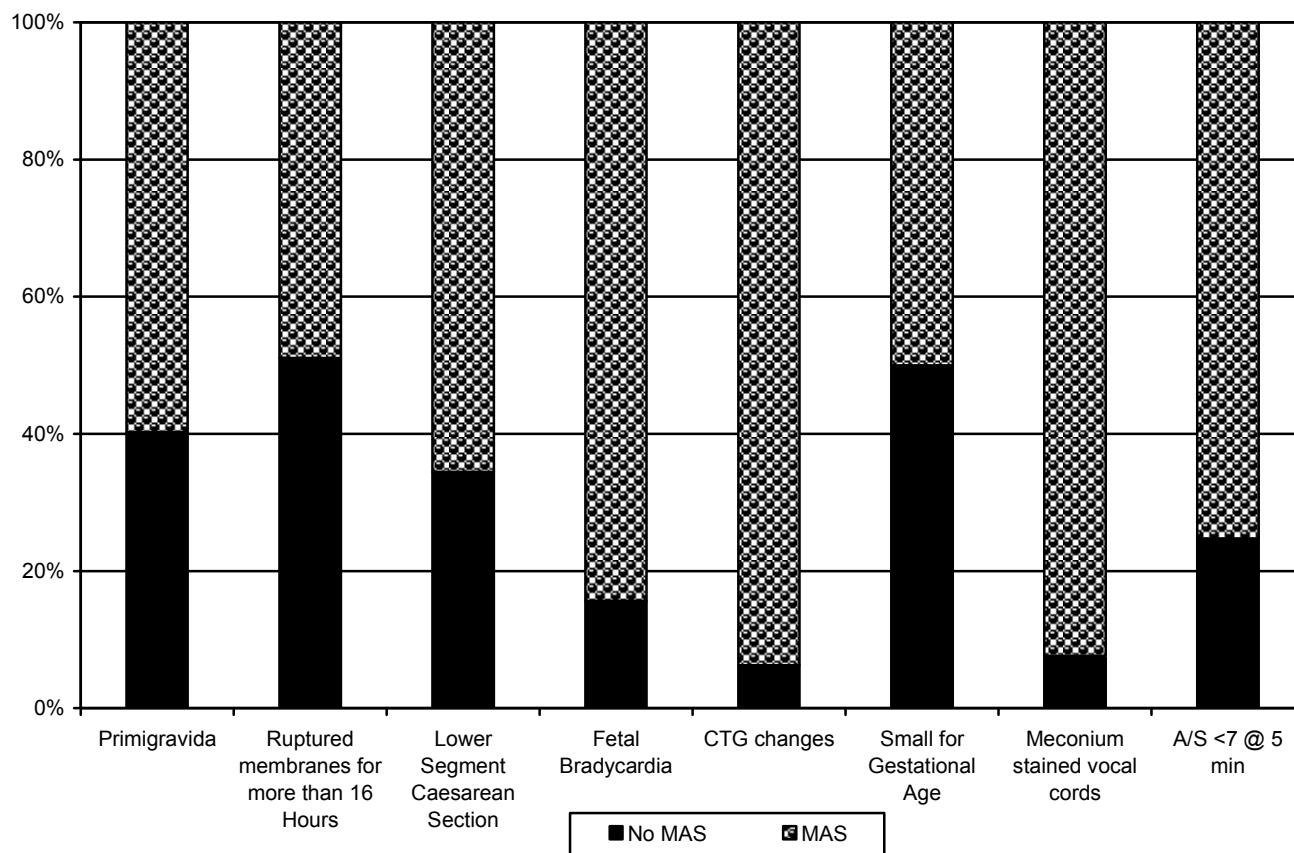


Fig. 2: Frequency of Risk Factors in MAS and No MAS Babies.

Out of 10 babies 2 (20%) died, while 8 were discharged after treatment.

Out of 10 babies with MAS 3 (30%) were born to primigravida mothers compared to 20 (20%) of asymptomatic babies. Ruptured membranes were found for more than 16 hours in mothers of 3(30%) babies with MAS while in 31 (31.3%) of asymptomatic babies.

Delivery through caesarean section was carried out in 4 (40%) of babies with MAS compared to 21 (21.2%) asymptomatic babies. Antenatal monitoring showed fetal bradycardia in 7 (70%) babies with MAS and only in 13 (13.13%) of asymptomatic babies, whereas cardiocotographic changes in form of poor beat to beat variability and/or type II decelerations were considered significant and were found in 6 (60%) babies with MAS and 4 (4%) of asymptomatic babies. Meconium stained vocal cords were found in 8 (80%) of babies with MAS and in 6 (6.06%) of asymptomatic babies. APGAR scores AT 5 minutes were recorded and were found to be less than 7 in 7 (70%) babies with MAS and in 23 (23.3%) babies in asymptomatic group.

Discussion

Results of this study show that 7.9% of meconium stained babies develop meconium aspiration syndrome with 20% mortality. This percentage though on higher side correlates with the percentages found in studies carried out in different parts of the world.

In 2 different studies in India, Gupta⁷ showed 6% of meconium stained babies develop MAS, whereas Bhasker⁸ found 23.7% MAS in meconium stained babies with mortality of 18.1%. In a study of 133 infants at low risk for meconium aspiration, who did not undergo tracheal suctioning, Wiswell found that 9% developed MAS.⁹

Similarly studies carried out in more advanced countries like USA showed comparable results. Liu and Harrington in their study showed that 6.8% of meconium stained babies develop respiratory symptoms.¹⁰

Factors studied to see their relationship with development of MAS in meconium stained babies were parity of mothers, presence of ruptured membranes for

more than 16 hours, mode of delivery, evidence of fetal distress in form of fetal bradycardia and cardiocytographic changes including poor beat to beat variability or presence of type II deceleration, weight of the baby, meconium staining of vocal cords and APGAR score less than 7, at 5 minutes. Study results show significant factors associated with development of MAS in meconium stained babies were, delivery through caesarean section, fetal distress, meconium stained vocal cords and APGAR score less than 7 at 5 minutes. These results correlate with different studies carried out in different parts of the world including Oman,^{2,1} Spain,¹² India,^{13,14} Lahore,¹⁵ Turkey,¹⁶ USA,^{17,18} China¹⁹ and Australia.²⁰

Conclusion

7.9% of meconium stained babies develop MAS with 20% mortality. Important risk factors associated with development of MAS included delivery through caesarean section, fetal distress in form of CTG changes and fetal bradycardia, meconium stained vocal cords and low APGAR score at 5 minutes. A combined pediatric and obstetric effort may help to reduce MAS in meconium stained babies by regular antenatal examination, intra partum fetal monitoring and delivery room resuscitation in high risk babies.

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