

# Morbidity and mortality of babies with complications of meconium stained amniotic fluid

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## Abstract

**Background:** Foetal well-being has traditionally been evaluated on the basis of foetal activity, foetal heart rate and presence of meconium in liquor amnii in vertex presentation. The passage of foetal meconium resulting in Meconium stained amniotic fluid (MSAF) occurs in approximately 8 to 25% of all deliveries, primarily in situations of advanced foetal maturity or foetal stress. **Aim and Objectives:** To study morbidity and mortality among babies presenting with complications of MSAF. **Material and methods:** It's a prospective observational study. The study population included all the babies born with MSAF in the tertiary care centre during study period of 2 years from Nov 2014 to Oct 2016. The babies meeting the criteria for admission are admitted in NICU and managed as per the protocols. **Results:** Incidence of deliveries with meconium stained amniotic fluid was 4.24%. Most common complication in babies born with MSAF was meconium aspiration syndrome (62.5%) followed by PPHN (42.04%). The incidence of meconium aspiration syndrome in babies with MSAF found to be 8.1% while, mortality due to MAS syndrome comes out to be 20%. **Summary and Conclusions:** Incidence of MSAF varies with place to place in accordance with study population and availability of antenatal care facilities. Meconium aspiration syndrome is an important cause of morbidity and mortality among newborns in the developing world.

**Key Words:** Meconium, complications.

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all births.<sup>2</sup> It's more commonly seen in terms and post term deliveries. Passage of meconium considered physiological exhibiting sign of foetal maturity on one hand & a sign of foetal distress a response to hypoxic insult on the other hand.<sup>3</sup> Meconium stained infants are considered 100 times more likely to develop MAS, compared with infants born through clear amniotic fluid. Meconium aspiration syndrome (MAS) is an important cause of morbidity and mortality among newborns in the developing world. It develops in 5% of infants born with meconium stained amniotic fluid (MSAF).<sup>2</sup>

## INTRODUCTION

Meconium stained amniotic fluid (MSAF) is a frequent occurrence in neonatal practice during delivery. The passage of meconium typically occurs within 48 hours after birth. However intrauterine passage of meconium has been linked to foetal hypoxia and acidosis, abnormal foetal heart tracing and low APGAR scores.<sup>1</sup> Incidence of meconium stained amniotic fluid ranges from 10-15% of

## MATERIAL AND METHODS

The present study is prospective observational study. The study population included all the babies born with meconium stained amniotic fluid in the tertiary care centre during study period of 2 years from Nov 2014 to Oct 2016. The study design and methodology was approved by the institutional ethical committee. Following a valid informed consent by relatives of

eligible neonate, a detailed history was noted as per the predesigned and pretested proforma. Variables like maternal age, parity, booking status, weight and height, mode of delivery is noted. All the babies meeting the inclusion criteria like neonates born at our tertiary care centre with meconium stained amniotic fluid included in the study while, those babies born outside the tertiary care centre, babies born with congenital anomalies, intrauterine deaths, breech and multiple gestations (twins and more) also, babies with other than cephalic presentation were excluded from the study. The babies meeting the criteria for admission are admitted in NICU and managed as per the protocols.

### RESULTS AND OBSERVATIONS

The total number of deliveries during the two year study period from Nov 2014 to Oct 2016 were 15980 out of which 674 had meconium stained amniotic fluid. Incidence was 4.24%.

**Table 1:** Incidence of meconium stained Amniotic fluid

Total deliveries during study period	Deliveries with MSAF	Percentage
15890	674	4.24%

**Table 2:** Incidence of foetal distress in babies born with MSAF

Total number of babies with MSAF	Babies with foetal distress	Percentage
674	212	31.45%

Table 04 shows significant number of babies were having antenatal foetal distress accounting for 31.45%. Out of 674 babies born with MSAF, 586 babies had no complications and were kept with mother and subsequently discharged. A total of 88 babies were admitted in NICU and most of them developed 1 or more complications during their course in NICU.

**Table 3:** Incidence of complications in babies born with MSAF admitted in NICU

Complications	No. of Cases (N=88)	Percentage
Birth asphyxia	23	26.13%
MAS	55	62.5%
HIE	11	12.5%
Septicemia	26	29.54%
PPHN	37	42.04%

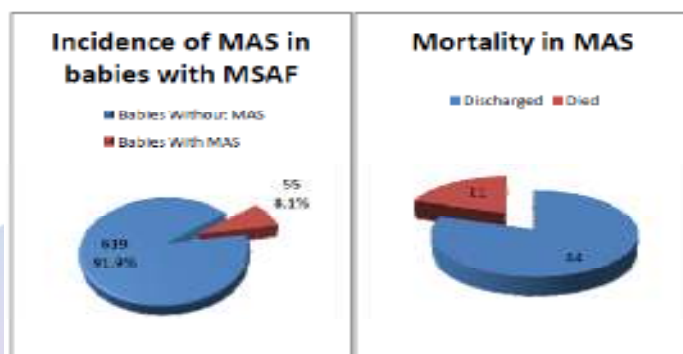
Neonates from our study population developed the above complications either singly or in combination. Most common complication was Meconium aspiration syndrome (62.5%) followed by PPHN i.e. Persistent pulmonary hypertension of the newborn (42.04%). Least common complication was HIE (Hypoxic Ischemic Encephalopathy). Of all the deaths in our study population, most babies developed one or more of the

above complications. MAS with one or more of the above complication remained the commonest cause of death.

**Table 4:** Incidence of meconium aspiration syndrome in babies with MSAF

Total Babies With MSAF	No. of Babies With MAS	Incidence	Mortality
674	55	8.1%	20%

Out of 674 babies born with meconium stained amniotic fluid, 55 babies were having meconium aspiration syndrome. Its incidence being 8.1%. Out of 55 babies diagnosed with meconium aspiration syndrome, 11 babies died. Hence mortality due to MAS syndrome comes out to be 20%.



**Figure 1:**

**Table 5:** Mortality in the babies born with meconium stained amniotic fluid

No. of babies born with MSAF	No. of babies died	Percentage
674	15	2.22%

Out of 674 babies born with MSAF, 659 babies were discharged while, 15 babies died accounting for 2.2% mortality rate.

### DISCUSSION

Out of 15890 deliveries during study period, 674 babies were born with MSAF. Thus the incidence of MSAF was found to be 4.2 % in our study. Our results are similar to the study conducted by Shaikh EM *et al*<sup>4</sup> in 2006 showing 4% incidence of MSAF in their study. Also, the study done by Supriya K *et al*<sup>5</sup> in has results comparable with our study, their incidence being 6.1 %. In 2013, Manohar R *et al*<sup>6</sup> in their study showed the incidence of MSAF as 20.1%. Foetal distress had significant association in determining the passage of meconium. Comparable results with our study (31.45%) were found in the study done by Vora H *et al*<sup>7</sup> (22.22%). Gupta V *et al*<sup>8</sup> (1994) also studied and found foetal distress in 24.5% babies. In our study out of 88 babies admitted in NICU, many babies had one or more complications. 55 babies were diagnosed to have MAS (62.5%) followed by PPHN seen

in 37 babies (42.04%). Birth asphyxia, septicemia, HIE accounts for 26.13%, 29.54% and 12.5% (Table No. 03) The most common complication i.e. meconium aspiration syndrome (62.5%) that is found in present study seen in 40% babies of MSAF by Priyadarshani M *et al*<sup>9</sup> (2012) while, Rajput S *et al*<sup>10</sup> (2016) in another study found it in 5% babies. The second commonest complication in babies born with MSAF in our study was PPHN i.e. Persistent pulmonary hypertension of the newborn (42.04%). Few other studies by Shaikh M *et al*<sup>11</sup> (2015) found it in 20.8% while, Fischer *et al*<sup>12</sup> (2013) found in 17% of babies. This variation in results of development of PPHN may be due to difference in guidelines for surfactant therapy whereby liberal use of surfactant in neonates with MAS was adopted in Fischer's study, which is known to reduce the development of pulmonary hypertension. In our study only 3 babies were given surfactant. Septicemia as a complication in our study was found in 29.54% babies comparable with study by Vora H *et al*<sup>7</sup> (2014) found to be in 30% babies. Meconium aspiration syndrome was the major cause of mortality in the babies with MSAF in our study. Incidence of MAS was found to be 8.1%. Comparing results to our study were seen in other studies by Gauchan E *et al*<sup>13</sup> (8.4%), Parvin MI *et al*<sup>14</sup> (10%), Rokde J *et al*<sup>15</sup> (5.5%) and in contrast to results of our study by Khazardoost *et al*<sup>16</sup> (21.1%) Mortality rate due to MAS in our study found to be 20%. Mortality in MAS seen in various studies comparable results to our study seen in studies by Shaikh M *et al*<sup>11</sup> (19.4%), Gupta V *et al*<sup>8</sup> (22.2%), Gauchan E *et al*<sup>13</sup> (14%) while, contrasting results observed in study by Supriya K *et al*<sup>5</sup> (40%). In our study, mortality due MSAF is 2.2% which is comparable with the studies done by Manohar R *et al*<sup>6</sup> (2.6%) and Parvin MI *et al*<sup>14</sup> (4%) while Gupta V *et al*<sup>8</sup> found mortality due MSAF to be 4.9%.

## SUMMARY AND CONCLUSIONS

Among the total number of deliveries, 674 babies were born with meconium stained amniotic fluid with an incidence of 4.2%. Significant number of babies with MSAF was having antepartum foetal distress. Meconium aspiration syndrome is the most common complication of MSAF followed by Persistent pulmonary hypertension of the newborn and septicemia. Least common complication was HIE (Hypoxic Ischemic Encephalopathy). Incidence of meconium aspiration syndrome was 8.1% among babies born with MSAF and is the most common cause requiring NICU admission. Mortality due to MSAF is 2.2% while, due to MAS is 20%.

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