

# Incidence and mortality in the babies with meconium aspiration syndrome admitted in NICU

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## Abstract

**Background:** Passage of meconium considered physiological exhibiting sign of foetal maturity on one hand and a sign of foetal distress a response to hypoxic insult on the other hand. Intrauterine foetal gasping, mechanical airway obstruction, pneumonitis, surfactant activation, and damage of umbilical vessels all play roles in the pathophysiology of meconium aspiration. Its more commonly seen in terms and post term deliveries. **Aim and Objectives:** To study the incidence and mortality in babies with meconium aspiration syndrome admitted in NICU. **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. Diagnosis of MAS is based on the presence of respiratory distress in an infant born through MSAF, with no alternate cause for respiratory distress. **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 aspiration syndrome.

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## INTRODUCTION

Meconium stained amniotic fluid is a frequent occurrence in neonatal practice during delivery. Incidence of meconium stained amniotic fluid ranges from 10-15% of all births.<sup>1</sup> Meconium stained infants are considered 100 times more likely to develop meconium aspiration syndrome (MAS), compared with infants born through clear amniotic fluid. Passage of meconium considered physiological exhibiting sign of foetal maturity on one hand and a sign of foetal distress a response to hypoxic

insult on the other hand.<sup>2</sup> Meconium aspiration syndrome is an important cause of morbidity and mortality among newborns in the developing world. It's classically has been defined as respiratory distress that develops shortly after birth, with radiographic evidence of aspiration pneumonitis and a history of meconium stained fluid.<sup>3</sup> Intrauterine foetal gasping, mechanical airway obstruction, pneumonitis, surfactant activation, and damage of umbilical vessels all play roles in the pathophysiology of meconium aspiration. There is also a strong association between MAS and persistent pulmonary hypertension of the newborn (PPHN). The pathophysiology of meconium aspiration and MAS is complex, and the timing of the initial insult resulting in MAS remains controversial.<sup>4</sup>

## 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. It is important to monitor infants born through MSAF for any signs of respiratory distress for at least 24 hours. Diagnosis of MAS is based on the presence of respiratory distress in an infant born through MSAF, with no alternate cause for respiratory distress. Chest radiograph and blood gas analysis should be performed if necessary.<sup>5</sup> 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 complications in babies born with MSAF admitted in NICU

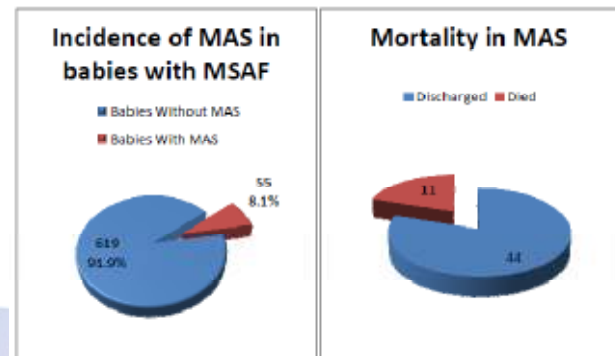
Complications	No. of Cases (N=88)	Percentage
Birth asphyxia	23	26.13%
MAS	55	62.5%
HIE	11	12.5%
Septicemia	26	29.54%
PPHN	37	42.04%

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 complications remained the commonest cause of death.

**Table 3:** Incidence of meconium aspiration syndrome in babies with MSAF

Total Babies With MSAF	No. Of Babies With MAS	Incidence Of MAS	Mortality Due To MAS
674	55	8.1%	20%

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



**Figure 1:**

## 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>6</sup> in 2006 showing 4% incidence of MSAF in their study. Also, the study done by Supriya K *et al*<sup>7</sup> in has results comparable with our study, their incidence being 6.1%. In 2013, Manohar R *et al*<sup>8</sup> in their study showed the incidence of MSAF as 20.1%. In our study, among the 674 babies born with MSAF, 88 babies were admitted in NICU of which 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% of babies (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. 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>11</sup> (8.4%), Parvin MI *et al*<sup>12</sup> (10%), Rokde J *et al*<sup>13</sup> (5.5%) and in contrast to results of our study by Khazardoost *et al*<sup>14</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>15</sup>(19.4%), Gupta V *et al*<sup>16</sup> (22.2%), Gauchan E *et al*<sup>11</sup>(14%) while, contrasting results observed in study by Supriya K *et al*<sup>7</sup>(40%).

## SUMMARY AND CONCLUSIONS

Among the total number of deliveries, 674 babies were born with meconium stained amniotic fluid with an incidence of 4.2%. Meconium aspiration syndrome is the most common complication of MSAF followed by Persistent pulmonary hypertension of the newborn and septicemia. Incidence of meconium aspiration syndrome is 8.1% among babies born with MSAF also it's the most common cause requiring NICU admissions while, mortality due to meconium aspiration syndrome is 20%. There is currently no way to distinguish between the infant who has developed MAS by intrauterine respiration or gasping and the infant who has developed MAS by inhalation of meconium at the first breaths after delivery.

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