

# To Determine the Frequency of Meconium Aspiration Syndrome in Infants and its effects & treatments with relevance to Pneumothorax and Sepsis

IRFANA ISHAQ SINDHU<sup>1</sup>, SURRIYA JABEEN<sup>2</sup>, SAJIDA YASMEEN<sup>3</sup>

## ABSTRACT

**Background:** We wanted to examine within a large population of live births, the incidence, risk factors, treatments, complications and outcomes of Meconium Aspiration Syndrome.

**Aim:** To determine the frequency of Meconium Aspiration Syndrome in infants and its effects and treatments with relevance to pneumothorax and sepsis.

**Methods:** A cross-sectional study was conducted among 100 cases of the MAS. The data obtained was analyzed and described. The duration of the study was six months at the Department of Pediatrics, General Hospital, Lahore and the design was 'Descriptive Case Series Study.

**Results:** The most common risk factor was found to be post-maturity. Gender studies showed that 71% were male while 29% were female. Complications like Pneumothorax were observed in 25% of the babies and sepsis in 36% of the patients that underwent MAS and amongst them 40% of the patient's required mechanical ventilation. It was seen that 35% of the patients with MAS died while 65% of the patients were discharged.

**Conclusion:** It is seen that the risk of MAS is has significantly decreased but is still an important contributor to hospital based early neonatal morbidity and mortality. The newborns that develop the problem of MAS can be dealt and treated with the use of broad-spectrum antibiotics and assisted mechanical ventilation. Babies that develop pneumothorax should be treated in ICU under surgeons.

**Keywords:** Meconium Aspiration Syndrome, morbidity, mortality, sepsis, newborn, pneumothorax

---

## INTRODUCTION

Meconium Aspiration Syndrome (MAS) is a disease of the infants associated with respiratory morbidity. It is associated with respiratory-distress in the meconium-stained infants and one-third of the newborns need intubation and mechanical ventilation. Meconium is a term used for the neonatal's first stool. It is chiefly composed of epithelial cells, hair, amniotic fluid, glycoproteins, minerals, lipids and water. It is usually stored in the intestine until after birth but sometimes during prolonged and difficult deliveries, infants often expel meconium into amniotic fluid.

Some important risk factors for the development of MAS have been identified in the general population or in infants born through meconium stained amniotic fluid (MSAF). The presence of fetal abnormalities, heart rate problems, poor Apgar score has been seen to increase the risk of MSAF. Cesarean delivery has also been seen to increase the incidence of MAS.

Incidence of MAS can be present in varying degrees of severity from mild to life-threatening. Infants with MAS typically have respiratory distress within the first hour with marked tachypnea and cyanosis.

The aim of this study is to determine the outcome of the disease with respect to neonatal morbidity. Recent literature is not available regarding this issue thus we want to assess the changes with recent advances in broad spectrum antibiotics and assisted mechanical ventilation.

## MATERIALS AND METHODS

The study was carried out at the Department of Pediatrics in General Hospital, Lahore for six months with a sample size of 100 cases. The sampling technique was non-probability, purposive sampling. The criterion for the study was neonates presented with respiratory distress along with meconium staining of vocal cords and body on the first day of life.

**Data Collection Procedure:** 100 neonates fulfilling the inclusion criteria were admitted in the gynecology department. Consent from parents was taken and they were informed of the procedure. Neonates will be examined daily and assessed after their admission in the nursery by a post graduate

---

<sup>1</sup>Fellow Paediatrics Oncology Shokut Khanum Hospital, Lahore  
Email irfanajaffar@gmail.com Cell.03347232222

<sup>2</sup>Assistant Professor Continental Medical College Lahore

<sup>3</sup>Assistant Professor Amna Inayat Medical College Dist. Sheikhupura.

Correspondence to Dr. Surriya Jabeen Email:  
drjabeen2020@gmail.com

resident for any complication. Chest X-ray, CBC and Blood Test will be performed when there is suspicion of infection. Depending on the result, mechanical ventilation will be given. All information with regards to complications, infections and ABG's will be stored and entered in the hospital records in the preformed Performa.

**Data Analysis:** The data will be analyzed using SPSS-10 computer system. Descriptive statistics will be applied in the form of frequencies and percentages for qualitative variable like gender and morbidity (Pneumothorax, sepsis) & mechanical ventilation & in-hospital outcome (discharge or death) while means and standard deviation for qualitative variables like age of neonate and gestational age at presentation. As study is descriptive so no test of significance is applicable.

## RESULT

In this study, 100 patients with MAS were observed for seven days of their life. Commonest risk factor was seen to be post-maturity (36%) with other factors including poor APGAR score (45%). About 64% of the patients were born at term while 36% were post-mature. Complications due to MAS were Pneumothorax in 25% while 36% of the babies developed sepsis. 39% of the babies developed no complications. These babies were investigated by chest X-rays, which showed air-trapping and hyperexpansion in 27%, Pneumothorax in 25% and atelectasis in 9%. No changes were observed in 34%. Out of 100 patients 35% expired, 65% of the babies survived and discharged.

Table 1: Distribution of patients regarding gender

Gender	n	%age
Male	71	71
Female	29	29

Table 2: Perinatal risk factors associated with MAS

Risk Factors	n	%age
Post Factors	36	36
Poor	45	45

Table 3: Distribution of patients regarding gestational age

Gestational Age	n	%age
Term	64	64
Post Term	36	36

Table 4: Chest X-ray findings in newborns with MAS

Chest X-Ray Finding	n	%age
Air trapping & hyper Expansion	37	37
Pneumothorax	25	25
Diffuse Infiltration	8	8
Atelectans	9	9
No Changes	21	21

Table 5: Results of blood cultures in patients with sepsis 14 babies

Organisms	n	%age
Pseudomonas	10	10
Klebsiella	16	16
S. Aureus	8	8
E.Coli	2	2

Table 6: Frequency of Complications in MAS

Complications	n	%age
Pneumothorax	25	25
Sepsis	36	36

Table 7: Assisted Mechanical Ventilation in Patients with MAS

Mechanical Ventilation	n	%age
Yes	40	40
No	60	60

Table 8: Causes of Death in Newborns with MAS

Causes of Death	n	%age
Sepsis	22	22%

Table 9: In-hospital Outcome of Patients with MAS

In-hospital outcome	n	%age
Death	35	35
Discharge	65	65

## DISCUSSION

MAS is a problem found all over the world, irrespective of race and ethnicity. In this study, we observed the epidemiology of MAS in ventilated infants. The reduction in incidence cannot be ascribed to more zealous delivery room management, in particular, tracheal suctioning. Indeed, in the latter part of the study period, routine intubation of the trachea after MSAF was largely abandoned in Australia and New Zealand. In Pakistan, it has been a leading cause of admissions in NICU, found to be the fifth in list in a study done by Prakash in Karachi after infections, asphyxia, jaundice and prematurity.

The most common complication was sepsis in 36% of the babies. Although meconium aspiration is also associated with secondary bacterial pneumonias due to microorganisms, these babies also developed infections due to other factors. This study also highlighted some other important variables like risk factors for MAS. The most common was post-maturity. It is important to note that avoidance of post-maturity pregnancy is a preventable factor in MAS. Another factor was APGAR score in 45% patients. It has been organized that this reduction might be due to intrapartum suctioning of the baby when head is delivered.

As far as good outcome is concerned, combines obstetric and pediatric care can lead to prevention and reduced severity of meconium aspiration syndrome.

## CONCLUSION

We found in this study that the incidence of MAS requiring intubation in 2 countries in the developed world is low and seems to be decreasing. The risk of MAS is significantly greater in the presence of fetal distress and low Apgar score, as well as Pacific Islander and indigenous Australian ethnicity. MAS is now frequently treated with newer therapeutic modalities, such as HFV, iNO, and exogenous surfactant, but the duration of ventilation and oxygen therapy have not been improved as a result. Mortality for MAS is low, but there remains a significant risk of pneumothorax.

## REFERENCES

1. Fanaroff AA. Meconium aspiration Syndrome historical aspects. *J perinatal* 2008; 28 Suppl 3:S3
2. Khan PA. Meconium aspiration syndrome. In : *Basis of Pediatrics*. 7<sup>th</sup> ed. Multan: Nishtar Books; 2008. 179-181
3. Bhutani V, K Developnig a systems approach to prevent meconium aspiration syndrome: lessons learned from multinational studies. *J Perinatol* 2008; 28 suppl 3:S30.
4. Walsh MC, Fanaroff JM. Meconium stained fluid: approach to the mother and the baby. *Clin perinatal*. 2007 Dec; 34:653-65.
5. Qurihi D, Jaffar A.J, Majeed R. Risk Factors for neonatal sepsis. *Med Forum* 2010; 21:7-11
6. Anwer Z, Butt TK, Kazi MY. Mortality in meconium aspiration syndrome in hospitalized babies. *J Coll Physicians Surg Pak*. 2011; 21:695-9
7. Usta IM, Merser BM and Sibai BM. Risk factors for meconium aspiration syndrome. *Obstet Gynecol*. 1995; 86:230-4
8. Rossi EM, Philipson EH, Williaqms TG, Kalhan SC. Meconium aspiration syndrome: intrapartum and neonatal attributes.
9. Vidyasagar D, Harris V, Pildes RS. Assisted ventilation in infants with meconium aspiration syndrome. *Pediatrics*.
10. Wiswall TE, Gannon CM, Jacob J, et al. Delivery room management of the apparently vigorous meconium-stained neonate: results of the multicenter, the international collaborative trial. *pediatrics*.
11. Downes JJ, Vidyasagar D, Boggs TR Jr, et al. Respiratory distress syndrome of newborn infants. I. New clinical scoring system with acid-base and blood-gas correlations.
12. Kinsella JP, Truog WF., et al. Randomized, multicenter trial of inhaled nitric oxide and high-frequency oscillatory ventilation in severe, persistent pulmonary hypertension of the newborn. *J Pediatr*.
13. Halliday HL, Sweet DG. Endotracheal intubation at birth for preventing morbidity and mortality in vigorous, meconium-stained infants born at term. *Cochrane Database Syst Rev*. 2001; (1): CD000500.
14. Greenough A, Pulikot A, Dimitriov G. Prevention and management of meconium aspiration syndrome - assessment of evidence based practice. *Eur J Pediatr* 2005; 164(5):329-30.
15. Goldsmith JP. Continuous positive airway pressure and conventional mechanical ventilation in the treatment of meconium aspiration syndrome. *J Perinatol*.