

A study of the associated factors for meconium aspiration syndrome at tertiary health care center

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Abstract

Background: Meconium Aspiration Syndrome (MAS) is defined as development of respiratory distress in newborns soon after birth, which have got radiological evidence of aspiration pneumonia along with meconium staining of liquor and staining of nails or staining of umbilical cord or skin. **Aims and Objectives:** To study associated factors for meconium aspiration syndrome. **Methodology:** This prospective study was conducted in NICU of department of Pediatrics of tertiary care center from 1st January 2016 to January 2017. All babies with meconium stained amniotic fluid were taken into study irrespective of the gestational age were included into study while Neonates with Transient Tachypnea of Newborn, Neonates with Respiratory Distress Syndrome, Neonates with congenital pneumonia, Neonates with congenital heart disease with congestive cardiac failure were excluded from the study. Total 163 neonates. The statistical analysis done by Chi-square test calculated by SPSS 19 version of the software. **Result:** In our study we have found that The majority of the patients were full term i.e. Gestational age (wk.) > 37 were 96.93 %, followed by 30-37 were 2.45%, and 28-30 were 0.61% respectively. There was no association between the sex of the babies and the MAS or asymptomatic MSAF ($P < 0.2189$, $X^2 = 1.512$, $df = 1$). The majority of the patients were Primi 69 % followed by Multi in 31 %. Out of 163 neonates studied, anemia 41 (25%) was the most frequent perinatal risk factor followed by fetal distress 37 (23) and PIH 23 (14%) and Post-Term in 10% individuals. In this study, it was found that there was a significant association between thick MSAF and the development of MAS ($P < 0.0001$, $X^2 = 35.68$, HS). **Conclusion:** It can be concluded from our study that the majority of the patients were full term anemia was the most frequent perinatal risk factor followed by fetal distress and PIH. It was found that there was a significant association between thick MSAF and the development of MAS.

Key Words: Meconium aspiration syndrome (MAS), Associated factors of MAS, PIH (Pregnancy Induced Hypertension), Anemia in Pregnancy.

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INTRODUCTION

Meconium Aspiration Syndrome (MAS) is defined as development of respiratory distress in newborns soon after birth, who have got radiological evidence of aspiration pneumonia along with meconium staining of

liquor and staining of nails or staining of umbilical cord or skin. Meconium seems to be toxic to the lungs. MSAF is comparatively more common in primi gravidas when compared to multi gravidas. Postdates, Eclampsia, Intrauterine growth retardation (IUGR), Oligohydramnios, Premature rupture of membrane (PROM) are main associating factors with occurrence of MSAF, in fact Regular antenatal checkups do not alter this high rates¹. India has high rate of claiming more than quarter of neonatal deaths of the total cases of neonatal mortality in the world². One of the main contributors is meconium stained amniotic fluid (MSAF) accounting for approximately 8% - 15% of live birth complications following delivery³. It has been seen that thick MSAF is mostly associated with maternal age >30, postdated pregnancy (>40weeks), and fetal distress⁴. Meconium is a thick, green viscous substance composed of epithelial

cells, vernix, lanugo, mucus, amniotic fluid, intestinal secretions, etc. Aspiration of meconium into the lungs results in a condition termed as meconium aspiration syndrome (MAS) leading to obstruction of the airways by meconium, loss of surfactant and chemical pneumonitis. The syndrome manifests as respiratory distress immediately or within a few hours after birth, hypoxemia, hypercapnia and acidosis. MAS can result in mortality in the newborn period or can have complications like persistent pulmonary hypertension, long term residual respiratory complications^{5, 6, 7, 8} and neuro developmental problems^{5, 8, 9}.

MATERIAL AND MEATHODS

This prospective study was conducted in NICU of department of Paediatrics of tertiary care centre from 1st January 2016 to January 2017. Total 163 neonates. Detailed history and clinical findings were recorded in the predesigned proforma. All babies with meconium stained amniotic fluid were taken into study irrespective of the gestational age were included into study while Neonates with Transient Tachypnea of Newborn, Neonates with Respiratory Distress Syndrome, Neonates with congenital pneumonia, Neonates with congenital heart disease with congestive cardiac failure were excluded from the study. A detailed history in all cases was taken with emphasis on parity, duration of labor, thick or thin meconium stained amniotic fluid, premature rupture of membranes, medical illness like anemia, pregnancy induced hypertension, oligohydramnios, mode of delivery, birth weight, assessment of gestational age, signs of fetal distress, Assessment of gestational age was done using modified Ballardscore, The statistical analysis done by Chi-square test calculated by SPSS 19 version of the software.

RESULT

Table 1: Distribution of patients according to the gestation age (n=163)

Gestational age (wk.)	No. of cases (n)	Percentage (%)
> 37	158	96.93
30-37	4	2.45
28-30	1	0.61
Total	163	100.00

The majority of the patients were full term i.e. Gestational age (wk.) > 37 were 96.93%, followed by 30-37 were 2.45%, and 28-30 were 0.61% respectively.

Table 2: Distribution as per sex MAS

Mode of delivery	MAS	Asymptomatic MSAF	Total
Male	41	43	84.00
Female	31	48	79.00
Total	72	91	163.00

(P<0.2189, X²=1.512, df=1)

There was no association between the sex of the babies and the MAS or asymptomatic MSAF (P<0.2189, X²=1.512, df=1).

Table 3: Distribution of cases according to the parity of the mother (n=163)

Parity of mother	No. of cases (n)	Percentage (%)
Primi	112	69
Multi	51	31
Total	163	100

The majority of the patients were Primi69 % followed by Multi in 31 %.

Table 4: Shows the distribution of cases according to perinatal risk factors: (n=163)

Perinatal risk factors	No. of cases (n)	Percentage (%)
Cord around neck	7	4
Prolonged labour	13	8
Fetal distress	37	23
PROM	13	8
PIH	23	14
Oligohydramnios	11	7
APH	2	1
Post-Term	16	10
Anemia	41	25
Total	163	100

Out of 163 neonates studied, anemia 41 (25%) was the most frequent perinatal risk factor followed by fetal distress 37 (23) and PIH 23 (14%) and Post-Term in 10% individuals.

Table 5: Showing the distribution of MAS in Thick MSAF and thin MSAF

MSAF	MAS	Asymptomatic MSAF	Total
Thick MSAF	32	5	37
Thin MSAF	35	80	115
Total	67	85	152

(P<0.0001, X²=35.68, HS)

In this study, it was found that there was a significant association between thick MSAF and the development of MAS (P<0.0001, X²=35.68, HS)

DISCUSSION

The meconium aspiration syndrome (MAS) is one of the most common causes of respiratory distress in term and post term infants. The overall frequency of meconium stained amniotic fluid (MSAF) varies between 5% to 25% (median 14%).¹⁰ MAS occurs in about 10% of infants born through MSAF. Infants born through MSAF are 100 times more likely to develop respiratory distress compared to their counterparts born through clear amniotic fluid. Passage of meconium in utero in vertex presenting babies is suggestive of fetal distress and occurs due to placental dysfunction, post mature or small for dates babies and ante partum hemorrhage. The condition is uncommon in infants below 34 weeks of gestation^{10, 11}.

In our study we have found that The majority of the patients were full term i.e. Gestational age (wk.) > 37 were 96.93 %, followed by 30-37 were 2.45%, and 28-30 were 0.61% respectively. There was no association between the sex of the babies and the MAS or asymptomatic MSAF ($P < 0.2189$, $X^2 = 1.512$, $df = 1$). The majority of the patients were Primi 69 % followed by Multi in 31 %. Out of 163 neonates studied, anemia 41 (25%) was the most frequent perinatal risk factor followed by fetal distress 37 (23) and PIH 23 (14%) and Post-Term in 10% individuals. In this study, it was found that there was a significant association between thick MSAF and the development of MAS ($P < 0.0001$, $X^2 = 35.68$, HS). This was similar to Saroj Shekhar Rath *et al*¹² they found Among patients of MSAF, maximum were stained with thick meconium stain, most of them had cord staining with meconium. When APGAR score was considered at first one minute, most of them had score less than 3. Most common associated risk factors were maternal anaemia, neonatal birth asphyxia, hyperbilirubinemia. Also similar to Jyoti Ramesh Chandran¹³ they found Antenatal risk factors like IUGR, hypertensive disorders and oligoamnios is significantly associated with development of MAS also similar to Ramakishore *et al*¹³, Chandran *et al*¹² as follows

Major Risk Factors	Ramakishore <i>et al</i> ¹⁴ (n=50)	Chandran <i>et al</i> ¹⁵ (n=301)
Anemia	11 (22%)	69 (23%)
PIH	06 (12%)	38 (13%)
PROM	06 (12%)	36 (12%)
Prolonged Labor	02 (4%)	53 (18%)
Oligohydramnois		20 (7%)
APH		02 (1%)
Fetal distress	14 (28%)	24 (8%)
Post Term	04 (8%)	51 (17%)
Cord around neck	08 (16%)	

CONCLUSION

It can be concluded from our study that the majority of the patients were full term anemia was the most frequent perinatal risk factor followed by fetal distress and PIH. It was found that there was a significant association between thick MSAF and the development of MAS.

REFERENCES

1. Anjali Soni, Gunvant D Vaishnav, Jagdish Gohil. Meconium and its Significance and Obstetric Outcome. *MedScience* 2015; 4(1).]
2. Dhimant Parekh, Neonatal Care in India: Raising a generation by raising awareness [Online] 2010 Jan 5 [cited 2012 Jan 4].

3. John P. Cloherty, Eric C. Eichenwald, Ann R. Stark. Manual of Neonatal Care, 6th ed. New Delhi (India): Wolters Kluwer: 2008. p. 9, 28-34, 323-331, 383-386, 358-364.
4. Sankhyan Naveen, Sharma Vijay Kumar, Sarin Ritu, Pathania Kushla. Predictors of meconium stained amniotic fluid: a possible strategy to reduce neonatal morbidity and mortality. *J Obstet Gynecol* 2006 Nov-Dec; 56 (6) :514-517
5. Yeh TF. Core Concepts: Meconium Aspiration Syndrome: Pathogenesis And Current Management. *NeoReviews*. 2010. 11(9). E503-e512.
6. MacFarlane PI, Heaf DP. Pulmonary Function In Children After Neonatal Meconium Aspiration Syndrome. *Arch Dis Child*. 1988; 63:368-372.
7. Khan AM, Elidemir O, Epstein CE, Lally KP, Xue H, Blackburn M., et al. Meconium Aspiration Produces Airway Hyperresponsiveness And Eosinophilic Inflammation In A Murine Model. *Am J Physiol Lung Cell Mol Physiol*. 2002; 283(4). L785-L790.
8. Chandran JR, Uma DN, Rajeshwary U. Risk Factors For Meconium Aspiration And Mas (Meconium Aspiration Syndrome) In Neonates Born Through Meconium Stained Amniotic Fluid (Msaf) In A Tertiary Care Centre In Malabar (Kerala). *Journal of Evolution of Medical and Dental Sciences*. 2013; 2 (49):9489-9495.
9. Zoe I, Charalampos G, Charalampos S, Georgios C, Michail V, Nikolaos V. Association of Meconium Stained Amniotic Fluid with Fetal and Neonatal Brain Injury, INTECH Open Access Publisher, 2012.
10. Ross MG. Meconium aspiration syndrome – more than intrapartum meconium. *N Engl J Med*. 2005; 353:946-8.
11. Locatelli A, Regalia AL, Patregnani C, Ratti M, Toso L, Ghidini A. Prognostic value of change in amniotic fluid color during labor. *Fetal Diagn Ther*. 2005; 20:5-9
12. Saroj Shekhar Rath, Swapna Mahapatra. Epidemiology And Associated Risk Factors Of Meconium Aspiration Syndrome In A Tertiary Care Hospital, Odisha. *Indian Journal of Basic and Applied Medical Research*; June 2017; 6 (3): 209-216
13. Jyoti Ramesh Chandran, Uma Devi N. Risk Factors For Meconium Aspiration And Mas (Meconium Aspiration Syndrome) In Neonates Born Through Meconium Stained Amniotic Fluid (Msaf) In A Tertiary Care Centre In Malabar (Kerala). *Journal of Evolution of Medical and Dental Sciences* 2013; 2(49), December 09: 9489-9495.
14. Chandran JR, Uma DN, Rajeshwary U. Risk factors for Meconium aspiration and MAS (Meconium aspiration syndrome) in neonates born through meconium stained amniotic fluid (MSAF) in a tertiary care centre in Malabar (Kerala). *Journal of Evolution of Medical and Dental Sciences*. 2013 Dec 9; 2 (49):9489-95.
15. AV R, KL S, GM. A study on meconium aspiration syndrome cases attending to Government general hospital, Anantapuramu, Andhra Pradesh. *International Journal of Research Health Sciences*. 2015; 3(1):169-173.

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