



ORIGINAL RESEARCH PAPER

PERINATAL RISK FACTORS AND OUTCOMES OF MECONIUM ASPIRATION SYNDROME IN NEONATES WITH MECONIUM-STAINED AMNIOTIC FLUID: A PROSPECTIVE COHORT STUDY

Paediatrics

KEY WORDS: Meconium-stained Amniotic Fluid (MSAF), Meconium Aspiration Syndrome (MAS), Thick MSAF

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ABSTRACT

Background:- It is a relatively common problem occurring in 10-25% of all deliveries.^{2c}The most important concern with MSAF is its association with foetal distress and adverse perinatal outcome. MSAF is noted in presence of foeto maternal stress factors such as hypoxia and infection, independent of foetal maturation. Meconium passage is a developmentally programmed post-natal event because 98% of healthy new-born pass meconium in first 24 to 48 hours after birth. .MSAF commonly occur in post term pregnancies and is relatively rare in preterm deliveries. **Aim:-** To study the clinical profile, risk factors, aetiology, and outcomes of MAS in neonates admitted to a tertiary care centre. **Study Design:** Prospective study. **Participants:** The data was collected from 150 neonates born with MSAF presented with RD at GIMS Hospital Kalaburagi **Results:** - In this study male sexes were affected more than females, majority of the neonates were above 2.5kg and only very few (1 neonate) were less than 1.5kg. majority of the neonates were full term, it was found that there is a significant association between thick MSAF and the development of MAS, there is a strong association between thick MSAF and mortality in MSAF babies. Anemia 40 (26.6%) was the most frequent perinatal risk factor followed by fetal distress 30 (20) and PIH 24 (16%). **Conclusion:-** Newborns with thick MSAF were more likely to develop MAS and. Passage of thick meconium was significantly associated with respiratory distress carried a bad prognosis with increased risk of development of meconium aspiration syndrome and hypoxic ischaemic encephalopathy.

INTRODUCTION

Meconium is the first faeces of a new-born composed of materials ingested in the uterus. It includes intestinal epithelial cells, lanugo, mucus, amniotic fluid, bile, and water. Meconium is normally retained in the infant's bowel until after birth, but sometimes it is expelled into the amniotic fluid prior to birth or during labour and delivery. The stained amniotic fluid is called "meconium liquor" or "meconium-stained liquor" and this may be a sign of fetal distress.¹ It is a relatively common problem occurring in 10-25% of all deliveries.^{2c}The most important concern with MSAF is its association with foetal distress and adverse perinatal outcome. MSAF is noted in presence of foeto maternal stress factors such as hypoxia and infection, independent of foetal maturation. Meconium passage is a developmentally programmed post-natal event because 98% of healthy new-born pass meconium in first 24 to 48 hours after birth. .MSAF commonly occur in post term pregnancies and is relatively rare in preterm deliveries.²

Aim

To study the clinical profile, risk factors, aetiology, and outcomes of MAS in neonates admitted to a tertiary care centre.

MATERIAL AND METHODS

- **Study Design:** Prospective observational study.
- **Study Setting:** GIMS NICU, Gulbarga Institute of Medical Sciences, Kalaburagi
- **Study Sample:** 150 cases
- **Sampling Procedure:** Purposive Sampling.
- **Study Duration:** 12 months (10 may 2025- 10 may 2026)
- **Source of Data:** The data was collected from neonates admitted in GIMS NICU Gulbarga Institute of Medical Sciences Kalaburagi, Karnataka.
- **Inclusion Criteria:** Neonates born with MSAF liquor and presented with respiratory distress within 1 hour of birth.
- **Exclusion Criteria:** Neonates with major life-threatening congenital malformations were excluded.
- **Data Analysis:** Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp. Results on continuous measurement are presented as Mean $\pm$ SD and categorical as frequency, percentage.

RESULTS

150 neonates with meconium-stained amniotic fluid admitted in GIMS NICU. In this study males were 90 (60%) and females were 60(40%).

Table 1: The Distribution of Cases According to the Birth Weight (n=150)

Weight (Kg)	Number of cases(n)	Percentage (%)
>2.5	120	80
1.5-2.5	29	19.3
<= 1.5	1	0.66
Total	150	

Table 2: The Distribution of Cases According to the Gestation Age (n=150)

Gestational age (week)	Number of Cases	Percentage (%)
>37	147	98
30-37	3	2
28-30	0	
Total	150	

Table 3: The Distribution of MAS in Thick MSAF and Thin MSAF.

MSAF	MAS	Asymptomatic MSAF	TOTAL
Thick MSAF	32	4	36
Thin MSAF	35	79	114
Total	67	83	150

Pvalue:35.68 chisquare<0.001HS

significant association between thick MSAF and the development of MAS

Table4: The Distribution of Cases According to Perinatal Risk Factors, (n=150).

Perinatal risk factors	No of Cases	percentage
Cord around the neck	5	3.3
Prolonged labor	20	13.3
PIH	24	16
PROM	14	9.3
Fetal distress	30	20
Post term	17	11.3
Anemia	40	26.6
Total	150	100

Table5:The Outcome of Babies with Thick MSAF and Thin MSAF.

Nature of MSL	Discharge	Death	Total
Thick MSAF	22	13	36
Thin MSAF	114	0	114
Total	137	13	150

Chi-sq=47.93 P value =0.001 HS

Statistically significant association between thick MSAF and death of babies with MSAF

DISCUSSION

In the present study, 1348 babies were included in the study, out of which 150 babies had meconium-stained amniotic fluid. Therefore, the incidence of MSAF in the present study is 11.26%. In a study by Ross et al, the incidence of MSAF was found to be 12% which are comparable to the present study.⁷

Table 6: Comparison Studies Showing the Effect of Gestational Age on Meconium Passage In Fetus.

Authors	Total cases	GA(37-42)	GA(>42 weeks)
Ramakishore et al	50	46(92%)	04 (8%)
Chandran et al	301	250(83%)	51(17%)
Present study	150	131(87%)	15 (11%)

Table 7:-Comparison Study Showing Birth Weight in MSAF

Authors	Total cases	<2.5Kg	>2.5 Kg
Ramakishore et al	50	11(22%)	39(78%)
Chandran et al	301	45(15%)	256(85%)
Present study	150	30(20%)	120(80%)

Table 8:- Comparison Study Showing Distribution of Risk Factors in MSAF

Major risk factors	Ramakishore et al	Chandran et al	Present study
Anaemia	11(22%)	69(23%)	40(26.6%)
PIH	06(12%)	38(13%)	20(13.3%)
PROM	06(12%)	36(12%)	14(9.3%)
Prolonged labor	02(4%)	53(18%)	14(20%)
Fetal distress	14(28%)	24(8%)	30(20%)
Post term	04(8%)	51(17%)	17(11.3%)
Cord around neck	08(16%)		5(3.3%)

The variations in the occurrence of perinatal risk factors probably reflect differences in the rates of occurrence of the predisposing risk factors in the various studies

CONCLUSION

The maternal risk factors which were associated with the development of MSAF were anemia (26.6%), prolonged labour(13.3%), premature rupture of membranes, foetal distress (20%), PIH (16%), post-maturity (11.3%), oligohydramnios, cord around neck (3.3%). The risk factors which were significantly associated with the development of MAS were thick MSAF. Effective management of MAS requires a coordinated approach between obstetricians and paediatricians, beginning with thorough monitoring of maternal risk factors, newborn care, and the anticipation and treatment of potential complications.