



Neonatal Outcome and Associated Maternal Risk Factors of Meconium Stained Amniotic Fluid in Tertiary Care Hospital

Dr Satendra Singh Rajput

MD Pediatrics , PGMO(SNCU) KRH Hospital Gwalior Corresponding AUTHOR

Dr Deepika Yadav

Resident doctor, department of Obstetrics and Gynaecology , gajra raja medical college, Gwalior.M.P. -474001

ABSTRACT

Introduction; A cross-sectional observational study to Evaluate neonatal outcome and antenatal , intrapartum and neonatal attributes of MSAF as well as their incidence in 200 Inborn neonates born with MSAF.
Method; Detail history of babies and mother with MSAF noted with emphasis on antepartum and intrapartum risk factors and outcome in terms of morbidity and mortality taken.
Results; Incidence of MSAF in present study was 11.8%. Out of 1685 inborn neonates, 200 babies with MSAF admitted to NICU with most common indications being birth asphyxia (32.5%) and MAS (27.5%). Majority babies were delivered through thin MSL (65%) followed by thick (35%). Total number of deaths were 35 and most of these babies(34) had thick meconium with severe HIE and MAS.
Conclusion; Oligohydramnios, PIH, anemia and fetal distress were common antenatal and intranatal factors associated with MSAF. Major morbidity and indication for NICU admission was Birth asphyxia and MAS

KEYWORDS

Meconium Stained Amniotic Fluid, Birth Asphyxia, Neonatal Outcome

INTRODUCTION

The presence of meconium stained amniotic fluid (MSAF) is a serious sign of foetal compromise, which is associated with an increase in prenatal morbidity^{1,2}, clear amniotic fluid on the other hand is considered reassuring. Meconium stained amniotic fluid (MSAF), which occurs in about 10-15% of all pregnancies³, is common in term births and especially in post-dated deliveries. The etiology and pathophysiology of MSAF is poorly understood ⁴.Factors such as placental insufficiency, maternal hypertension, pre-eclampsia, oligohydroamnios or maternal drug abuse (tobacco or cocaine) result in, inutero passage of meconium. Caesarean sections were performed twice as frequently in women presenting with MSAF and failure to progress, which was the indication in more than half of the cases. The finding of MSAF is associated with multiple markers of fetal distress, as meconium-stained infants have in general lower scalp pH and lower umbilical cord artery pH in comparison with infants born through clear amniotic fluid ^{5,6}. Additionally, infants born through MSAF have lower Apgar scores in the first and fifth minute after delivery ^{7,8}.

MATERIAL AND METHOD:

A cross-sectional observational study was carried out over a one year period from April 2015 to march 2016 in the Neonatal intensive care unit and Post natal Ward of Gajra Raja Medical College and Kamla Raja Hospital, Gwalior.

Out of one thousand eight hundred five inborn neonates, 200 neonates delivered through MSAF, admitted to NICU & those with mother in PNC ward were included in the study. Babies born with MSAF who were having significant life threatening congenital abnormalities were excluded from this study.

Detail history of babies delivered with MSAF were noted with special emphasis on factors like need of resuscitation, need for NICU admission, consistency of meconium etc. and detail history of mothers was taken with emphasis on antepartum and intrapartum risk factors.

MSAF was further categorized on the basis of meconium consistency into thick (dark green in color, "pea soup" consistency

with particulate matter) and thin (lightly stained yellow or greenish color) meconium and compared for incidence of birth asphyxia, MAS and mortality¹⁰.

Morbidity of neonates were noted with emphasis on Meconium Aspiration Syndrome (MAS), Respiratory distress, birth asphyxia, ventilatory requirement, sepsis etc. Babies were followed up till the time of discharge and mortality was noted.

RESULTS

During the study period, a total of 1685 neonates admitted in NICU, Of these 200 (11.8%) had MSAF. 65% percent had thin meconium stained liquor, while 35% had thick MSL.

Incidence was found to be more in male neonates (65.2%). MSAF was greater in term deliveries (90%) whereas in pre-term deliveries, thick meconium found in majority cases (55.56%). A total of 53% babies born through MSAF had weight between between 2.5 and 3.5 kg followed by 40% babies having low birth weight (1.5 -2.5 kg).

Table 1 : Baseline Characteristics of Study cases

CHARACTERISTICS	THIN MECONIUM (n=130)	THICK MECONIUM (n=70)
SEX (%)		
Male (115)	75 (65.2%)	40 (34.78%)
Female (85)	55 (64.7%)	30 (35.3%)
GESTATION WEEKS (%)		
<37 (18)	8 (44.45%)	10 (55. 56%)
37-41 (180)	120 (66.67%)	60 (33.33%)
>42(2)	2(100%)	0
BIRTH WEIGHT (GMS) (%)		
<1500 (6)	0	6
1501-2500 (80)	46 (57.5%)	34 (42. 5%)

2501-3500 (106)	76 (71.7%)	30 (28. 3%)
>3500 (8)	8 (100%)	0

Common mode of delivery was Caesarean Section (85%). MSAF was more common in pregnancies associated with antenatal complications like Oligohydramnios (30%), pregnancy induced hypertension (26%), anemia (19%), antepartum eclampsia (4%), antepartum hemorrhage (4%),and hepatitis (4%). During labour, MSAF was more frequent in pregnancies with fetal distress (30%). Postdate pregnancy was found to be major risk factor with an incidence of 33%.

Table2. ANTENATAL AND INTRAPARTUM FACTORS ASSO-
CIATED WITH MSAF

VARIABLES ASSOCIATED WITH MSAF	THIN MECO- NIUM (n=130)	THICK ME- CONIUM (n=70)
ANTEPARTUM FACTORS		
APH (8)	4(50%)	4(50%)
PIH (52)	38(73.07%)	14(26.93%)
APE (8)	2(25%)	6(75%)
OLIGOHYDRAMNIOS (60)	28(46.6%)	32 (53.34%)
POLYHYDRAMNIOS (8)	6(75%)	2(25%)
ANEMIA (38)	26(68.45%)	12(31.57%)
HEPATITIS (4)	4	0
INTRAPARTUM FACTORS		
FETAL DISTRESS (FD) (60)	32 (53.34%)	28 (46. 6%)
(1) FD ALONE (40)	18 (45%)	22 (55%)
(2) FD WITH OL (6)	4 (66.7%)	2 (33. 3%)
(3) FD WITH NPL (2)	0	2
(4) FD WITH CORD PROB- LEMS (12)	10(83. 3%)	2 (16. 6%)
OBSTRUCTED LABOR (14)	4 (28. 57%)	10(71. 43%)
CORD PROBLEMS (12)	12	0
PROM (16)	10 (62.5%)	6 (37. 5%)
POSTDATE PREGNANCY (66)	50 (75.75%)	16(24. 25%)

Out of two hundreds inborn neonates admitted with MSAF , 165 discharged successfully and 35 neonates were certify. Most of these (97.1%) death were in thick meconium stained amniotic fluid group.

Analysis of neonatal outcome shows that birth asphyxia was the main cause for NICU admission with frequency higher with thin MSAF group followed by meconium aspiration syn-
drome(27.5%) and neonatal sepsis(22.5%).

Table 3 : Outcome of babies born through meconium
stained liquor

MORBIDITY(%)	THIN MECONIUM (n=130)	THICK MECONIUM (n=70)
BIRTHASPHYXIA (65)	60(92.3%)	5 (7.6%)
MAS (55)	25 (45.4%)	30 (54.5%)
HIE (23)	10(43.4%)	13 (56.5%)
PULMONARY HEMORRHAGE (2)	0	2
RDS (10)	10	0
NNS (45)	25(55.5%)	20(44.5)

DISCUSSION:

Meconium stained amniotic fluid (MSAF) is a frequent occurrence seen in obstetric and neonatal practice. In present study, the incidence of MSAF among admitted inborn neonates was

17.5% which was higher than other Comparable studies as this study had been included admitted inborn only while in other studies non admitted newborns were also included.
9,12,13,14

High prevalence of MSAF seen in male neonates with an incidence of 65.2%. Similar results were noted by National Neonatal Perinatal Database 2002-2003 ¹³ and Vineetagupta et al¹⁴. In the present study, 90% babies were term. Finding was comparable with other studies^{12, 15}. A. Narang et al concludes that majority babies were good weight with 76% weighing more than 2.5 Kg, 6.4% below 2.5 Kg and only 5.5% with MSAF were weighing less than 2 kg ¹². In our study, 53% babies had birth weight between 2.5 Kg and 3.5 Kg and 40% had low birth weight.

Mode of delivery is significantly affected by meconium staining of liquor and it is stated that Caesarean sections were performed twice as frequently in women presenting with MSAF ¹⁶. Incidence of Cesarean section was 85% in our study. Similar result observed by Shaikh et al in 2010¹⁶.

Of the various antenatal complications, Oligohydramnios, Pregnancy induced hypertension and Anemia had shown high prevalence in association with MSAF with an incidence of 30%, 26% and 19% respectively. In this study, incidence of oligohydramnios, PIH and anemia was higher than those reported by other authors ^{10,13,17}. As this study had been conducted in a tertiary center where a large number of complicated pregnancies including oligohydramnios, PIH and anemia are referred, their incidence was higher. During labour, fetal distress was high in pregnancies with MSAF with an incidence of 30%. Vineeta gupta et al also showed a high incidence of fetal distress ¹⁴.

Thick meconium is associated with more admissions to NICU as concluded by Nirmala Duhan et al ⁹ in contradictory to the present study as in thin MSAF group most neonates admitted with mild birth asphyxia. Neke akhtar et al¹⁸ observed that birth asphyxia is main cause for NICU admission in neonates associated with meconium passage in utero . Our study confirms this observation showing 32.5% incidence.

CONCLUSIONS

In the end it is concluded that the knowledge of Antenatal and intranatal factors associated with MSAF provide a way of early identification of high risk cases in resource poor setup where facilities like electronic fetal monitoring are not available, who can be managed by optimal timely intervention in order to avoid severe asphyxia and meconium aspiration and its complications.

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