

Management Practices in Cases with Meconium Stained Amniotic Fluid (MSAF) Babies

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Meconium Staining of Amniotic Fluid (MSAF) is a relatively common problem occurring in 8.0% to 15.0% of all deliveries. Meconium is very potent and toxic substance. Meconium aspiration syndrome (MAS) remains one of the most common causes of neonatal respiratory distress that occurs in MSAF. The aim of this present study was to evaluate the management practices of meconium stained amniotic fluid and perinatal outcome. This cross sectional study was carried out in the department of Obstetric and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka from January 2009 to June 2009. The samples were collected from the women who were admitted in labor ward with MSAF during the study period. Total 50 patients attending in the labor ward and In-patient Department of Obstetrics and Gynaecology, BSMMU were enrolled in this study. Out of all neonates, 86.0% required resuscitation, 58.0%, antibiotics, 8.0% steroid, 48.0% oxygen, 54.0% IV fluid and 10.0% adrenaline. With limited in resources in delivery room, it is observed that oropharyngeal suctioning, antibiotics, steroid, oxygen, IV fluid and adrenaline are the common practice in the resuscitation of meconium stained baby in our country.

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Key words: Meconium, amniotic, baby

Introduction

Meconium Staining of Amniotic Fluid (MSAF) is a relatively common problem occurring in 8.0% to 15.0% of all deliveries.¹ Meconium is very potent and toxic substance. Meconium aspiration syndrome (MAS) remains one of the most common causes of neonatal respiratory distress that occurs in MSAF. The most important concern with MSAF is its association with foetal distress and adverse perinatal outcome. The first intestinal

discharge from newborns is Meconium which is a viscous, dark green substance composed of intestinal epithelial cells, lanugo, mucus and intestinal secretions, such as bile. Intestinal secretions, mucosal cells, and solid elements of swallowed amniotic fluid are the 3 major solid constituents of Meconium. Water is the major liquid constituent, making up 85.0-95.0% of Meconium. Intrauterine distress can cause passage into the amniotic fluid. Factors that promote the passage in-utero include placental insufficiency, maternal hypertension,

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pre-eclampsia, oligohydramnios, and maternal drug abuse, especially of tobacco and cocaine.² Meconium Stained Amniotic Fluid may be aspirated during labour and delivery, causing neonatal respiratory distress. Because Meconium is rarely found in the amniotic fluid prior to 34 weeks' gestation, Meconium Aspiration chiefly affects infants at term and post-term. Ostero and Naqui (1982) found that 78.0% of MSAF occurred between 38 and 42 weeks of gestation. MAS develop in 5-10% of the babies born through MSAF.³ Despite the recent advances in neonatal care, at least 5% of MAS⁴ babies admitted to neonatal intensive care unit (NICU) has been reported to die. Five percent of MAS babies require oxygen in the neonatal period.³ Meconium stained amniotic fluid (MSAF) is a frequent occurrence seen by health care providers in obstetric and neonatal practice. Since it is a predictor of adverse perinatal outcome even in low risk pregnancies MSAF can be taken as an independent marker of fetal distress. Babies born with MSAF are under fold more likely to develop substantial respiratory distress than those born with clear amniotic fluid. Meconium aspiration syndrome (MAS) occurs in about 10.5% of neonates born with MSAF and carries a mortality rate of around 12.0%. Moreover the rates of severe mental retardation and cerebral palsy are significantly higher among infants born with MSAF. Of those neonates who develop MAS, thick MSAF has accounted for majority of 73 to 87.6% of cases of MAS.^{5,6,7}

Meconium is composed of swallowed amniotic fluid, fetal hair, gastrointestinal secretion and sloughed mucosal cells from the gut wall.⁸

Methods

This cross sectional study was carried out in the department of Obstetric and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka from January

2009 to June 2009. The samples were collected from the women who were admitted in labor ward with MSAF during the study period. Total 50 patients attending in the labor ward and In-patient Department of Obstetrics and Gynaecology, BSMMU were enrolled in this study

Case Selection was done on the basis of following characteristics

1. Meconium stained amniotic fluid diagnosed by spontaneous/artificial/intraoperative rupture of membranes.
2. Singleton pregnancy.
3. Participants, who gave consent and willing to comply with the study procedure, were included.

After discussing with patient and getting written consent from them a detailed history was taken, clinical examination was done. Gestational age by virtue of history, fundal examination and ultrasound was recorded. Routine hematological and urine examinations were done. Further cervical dilatation, character of meconium stained amniotic fluid, and fetal heart variability was noted. Partogram was maintained. Thin meconium is defined as very light green staining of amniotic fluid, and thick meconium as thick greenish meconium with particulate matter in amniotic fluid. Intrapertum resuscitative management practices like oxygen inhalation, left lateral position, intravenous fluids. Mode of delivery, mechanical oropharyngeal suction of baby was recorded. Neonatal details considering APGAR scoring, birth weight, respiratory distress was also recorded. Mother and neonate was followed up during their stay in the post natal ward. Patient was managed according to the direction of the senior obstetrician of that unit.

Results

In the present series maximum 52.0% patients were within 25 to 30 years age group followed

by 34.0% below 25 years and 14.0% above 30 years age group. All patients were within 19 to 35 years age group and mean age was 27.06 (± 3.85) year. In our study out of all patients 90.0% had gestational age less than 40 weeks and 10.0% had more than 40 weeks. Out of all patients 54.0% were primi and 46.0% were multi para.

Out of all patients maximum 56.0% had clinical history of PROM, 52.0% had hypertension, 44.0% had diabetes mellitus, 10.0% had chronic bronchitis or asthma, 4.0% had coronary heart diseases and 4.0% had history of abortion. 30.0% patients had spontaneous and 70.0% had induced labour. 22.0% patients had delivered per vaginally and 78.0% by caesarean section.

In clinical examination, Out of all patients 46 (92.0%) had features of edema, 23 (46.0%) had oligohydramnios and 42 (84.0%) had Fetal heart sound (Present & regular).

20.0% patients had PROM and 12.0% had pre-eclampsia. The rupture of membrane occurs spontaneously in 80.0% patients and induced in 20.0%.

All patients had complaints of abdominal pain, 86.0% had watery discharge, 56.0% had less fetal movement, and 10.0% had evidence of vaginal infection. Out of all patients maximum 72.0% had received regular antenatal care, 26.0% irregular and only 2.0% had not. Out of all neonate 86.0% had required resuscitation, 58.0%, antibiotics, 8.0% steroid, 48.0% oxygen, 54.0% IV fluid and 10.0% adrenaline.

Table I: Distribution of the respondents by age

Age (in year)	Frequency	Percent
<25	17	34.0
25-30	26	52.0
>30	7	14.0
Total	50	100.0
Mean \pm SD (Range)	27.06 \pm 3.85	19-35

Table I shows the age distribution of the patients. Maximum 52.0% patients were within 25 to 30 years age group followed by 34.0% below 25 years and 14.0% above 30 years age group. All patients were within 19 to 35 years age group and mean age was 27.06 (± 3.85) year

Table II: Distribution of the respondents by parity

Parity	Frequency	Percent
Primi	27	54.0
Multi	23	46.0
Total	50	100.0

Out of all patients 54.0% were primi and 46.0% were multi para.

Table III: Distribution of the respondents by gestational age

Gestational age	Frequency	Percent
<40 Weeks	45	90.0
> 40 Weeks	5	10.0
Total	50	100.0

Out of all patients 90.0% had gestational age less than 40 and 10.0% had more than 40

Table IV: Distribution of the respondents by presenting complaints

Presenting complaints	Frequency	Percent
Evidence of vaginal infection	5	10.0
Abdominal pain	50	100.0
Less fetal movement	28	56.0
Watery discharge	43	86.0

Table shows the presenting complaints of patients. All patients had complaints of abdominal pain, 86.0% had watery discharge, 56.0% had less fetal movement, and 10.0% had evidence of vaginal infection.

Table V: Distribution of the respondents by antenatal care

Antenatal care	Frequency	Percent
No care	1	2.0
Regular	36	72.0
Irregular	13	26.0
Total	50	100.0

Out of all patients maximum 72.0% had received regular antenatal care, 26.0% irregular and only 2.0% had not.

Table VI: Distribution of the respondents by clinical history

Clinical history	Frequency	Percent
History of abortion	2	4.0
History of PROM	28	56.0
Diabetes mellitus	22	44.0
Hypertension	26	52.0
Coronary heart disease	2	4.0
Chronic bronchitis/Asthma	5	10.0

Out of all patients maximum 56.0% had history of PROM, 52.0% had hypertension, 44.0% had diabetes mellitus, 10.0% had chronic bronchitis or asthma, 4.0% had coronary heart diseases and 4.0% had history of abortion.

Table VII: Distribution of the respondents by condition of labour

Labour	Frequency	Percent
Spontaneous	15	30.0
Induced	35	70.0

Table VI reveals 30.0% patients had spontaneous and 70.0% had induced labour.

Table VIII: Distribution of the respondents by mode of delivery

Mode of delivery	Frequency	Percent
Vaginal	11	22.0
Caesarean section	39	78.0

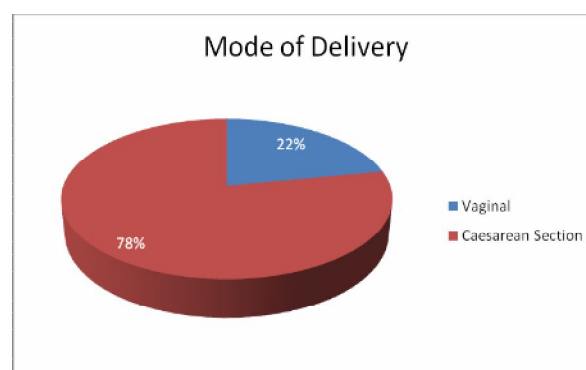


Figure 1. Pie diagram showing mode of delivery

Fig 1 reveals different findings of 22.0% patients had delivered per vaginally and 78.0% by caesarean section.

Table IX: Distribution of the respondents by clinical examination

Clinical examination	Frequency	Percentage
Oedema	46	92.0
Oligohydramnios	23	46.0
Fetal heart sound (Present & regular)	42	84.0

Out of all patients 46 (92.0%) had features of edema, 23 (46.0%) had oligohydramnios and 42 (84.0%) had Fetal heart sound (Present & regular).

Table X: Distribution of the respondents by maternal complication

Maternal conditions	Frequency	Percent
PROM	10	20.0
Pre-eclampsia	6	12.0

Table X shows 20.0% patients had PROM and 12.0% had pre-eclampsia.

Table XI: Distribution of the respondents by rupture of membrane

Rupture of membrane	Frequency	Percent
Spontaneous	40	80.0
Artificial	10	20.0

Table XI shows the rupture of membrane occurs spontaneously in 80.0% patients and induced in 20.0%.

Table XII: Frequency distribution of fetal outcome

Fetal outcome	Frequency	Percent
Sex		
Male	18	36.0
Female	32	64.0
Meconium aspiration	5	10.0
RDS	19	38.0
Fetal deformity	3	6.0
Neonatal jaundice	4	8.0
Neonatal death	2	4.0

Out of all baby 36.0% were male and 64.0% were female. 10.0% had meconium aspiration, 38.0% had developed RDS, 6.0% had deformity, and 8.0% had jaundice. Among all babies 4.0% were expired.

Table XIII: Physical parameters of newborn baby

Variables	Range	
Wt. of baby (kg) (Mean \pm SD)	2.82 \pm 0.48	2-3.8
APGAR score At 1 st minute (Median)	6.5	0-8
APGAR score At 5 th minute (Median)	9	6-9

Table XIII shown that mean weight of the baby was 2.82 (\pm 0.48) kg, Median APGAR score at 1st and 5th minute was 6.5 and 9 respectively.

Table IX: Distribution of the respondents by received treatment

Received treatment	Frequency	Percent
Neonatal resuscitation	43	86.0
Antibiotics	29	58.0
Steroid	4	8.0
Oxygen	24	48.0
IV fluid	27	54.0
Adrenaline	5	10.0

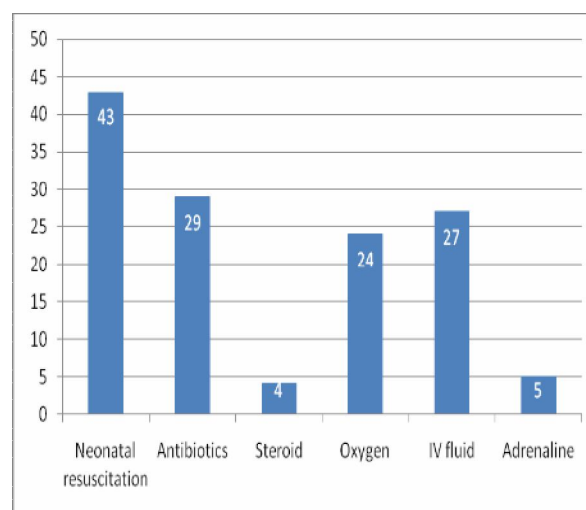


Figure 2. Bar diagram showing distribution of the respondents by received treatment

Out of all neonate 86.0% had required resuscitation, 58.0%, antibiotics, 8.0% steroid, 48.0% oxygen, 54.0% IV fluid and 10.0% adrenaline.

Discussion

The present study was undertaken to find the management practices in cases with MSAF and to study the morbidity and mortality in newborn babies with MSAF as well as their mothers.

In this study, out of all neonate 86.0% had required resuscitation, 58.0% antibiotics, 8.0% steroid, 48.0% oxygen, 54.0% IV fluid and 10.0% adrenaline.

The indication for intubation in MSAF babies is only for those who are depressed at birth irrespective of the consistency of meconium. For infants requiring endotracheal suctioning, vigorous stimulation and drying maneuvers are delayed until intubation is performed to avoid initiation of respiration. After clearance of the airway usual steps of resuscitation are performed. Bag and mask ventilation is contraindicated in MSAF babies who are depressed at birth and intubation for intra tracheal suctioning takes precedence for airway clearance. To date there are no data verifying the efficacy of chest physiotherapy either in preventing MAS or in treating the disorder. To date there have been no prospective randomized controlled trials assessing the potential benefits of cesarean versus vaginal delivery in preventing MAS. Negative pressure during suctioning of airway should not exceed – 120 mm of Hg. It should be applied continuously and not intermittently for optimal retrieval. An intriguing therapy is that of dilute surfactant lavage which has been found to be beneficial in human infants with established MAS.

Tracheal suction for the removal of meconium has been widely recommended for all infants born with MSAF.^{9,10} Although not randomized trials, these two publications demonstrated a reduction in mortality and morbidity associated with tracheal clearing of meconium immediately after birth. A 1990 analysis

showed a gradual reduction of the incidence of meconium aspiration syndrome and related mortality between 1973 and 1987.¹¹ Linder et al (1988)¹² and Liu and Harrington (1998)¹³ compared vigorous term infants with MSAF assigned to tracheal suction or routine care. Routine tracheal suction showed no clear benefit and was even associated with an increase in minor respiratory difficulty. In 2000, a large, randomized, controlled study by Wiswell et al¹⁴ examined infants with MSAF with >37 weeks' gestation, heart rates >100, and spontaneous breathing and displaying reasonable muscle tone within 10 to 15 seconds of delivery. The incidence of meconium aspiration syndrome in the group assigned to tracheal suction was almost identical to the incidence in the group assigned to routine care without tracheal suction. The NRP Steering Committee, representing the American Academy of Pediatrics and American Heart Association, was considered the evolving recommendations from the International Liaison Committee on Resuscitation.¹⁵

The neonates born with MSAF should be intubate who are depressed at birth irrespective of consistency of meconium. Application of cricoid pressure, chest compression or occlude airway by fingers should not be done to prevent initiation of respiration in MSAF babies.⁶

Conclusion

Meconium staining of liquor is a commonly observed phenomenon. Since it is associated with increased incidence of perinatal morbidity and mortality, it cannot be overlooked. RDS, meconium aspiration, fetal deformity, and neonatal jaundice are the major morbidities of meconium stained babies. With limited in resources in delivery room, it is observed that oropharyngeal suctioning, antibiotics, steroid, oxygen, IV fluid and adrenaline are the common practice in the

resuscitation of meconium stained baby in our country.

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