Morbidity and Mortality in Newborn Babies with Meconium Stained Amniotic Fluid

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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 present study was under taken to find out the morbidity and mortality in newborn babies with Meconium stained amniotic fluid (MSAF). This cross sectional study was carried out in the department of Obstetric and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka from July 2008 to December 2008. 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. In the present study meconium stained amniotic fluid (MSAF) was associated fetal meconium aspiration (10.0%), fetal RDS (38.0%), fetal deformity (6.0%), and jaundice (8.0%). Among all babies 4.0% were expired. RDS, meconium aspiration, fetal deformity, and neonatal jaundice are the major morbidities of meconium stained babies

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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 fetal 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, preeclampsia, 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.

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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 MAS[4] 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 hundred 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, 9]

Methods

This cross sectional study was carried out in the department of Obstetric and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka from July 2008 to December 2008. 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

- Meconium stained amniotic fluid diagnosed by spontaneous/artificial/ intraoperative rupture of membranes
- Singleton pregnancy
- 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. Intrapartum resuscitative management practices like oxygen inhalation, left lateral position, intravenous fluids. Mode of delivery, mechanical oropharyngial suction of baby was recorded. Neonatal details considering APGAR scoring, birth weight, respiratory distress was also recorded. Mother and neonate were 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 (Table I**).** Educational status of the patients revealed maximum 48.0% were educated up to secondary level, 24.0% up to higher secondary, 18.0% primary and 10.0% graduate and above level (Table II).

Out of all patients 54.0% were primi and 46.0% were multi-para (Table III). In this study out of all patients 90.0% had gestational age less than 40 weeks and 10.0% had more than 40 weeks (Table IV).

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). Out of all patients maximum 72.0% had received regular antenatal care, 26.0% irregular and only 2.0% had not (Table VI). 30.0% patients had spontaneous and 70.0% had induced labour (Table VII).

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 VIII).

Mean weight of the baby was 2.82 (±0.48) Kg, Median APGAR score at 1st and 5th minute was 6.5 and 9 respectively (Table IX).

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 X).

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 ± SD (Range)	27.06 ± 3.85	19-35

Table II: Distribution of the respondents by educational status

Educational status	Frequency	Percent
Primary	9	18.0
Secondary	24	48.0
Higher secondary	12	24.0
Graduate and above	5	10.0
Total	50	100.0

Table III: Distribution of the respondents by parity

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

Table IV: 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

Table V: 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 VI: 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

Table VII: Distribution of the respondents by condition of labor

Labour	Frequency	Percent
Spontaneous	15	30.0
Induced	35	70.0

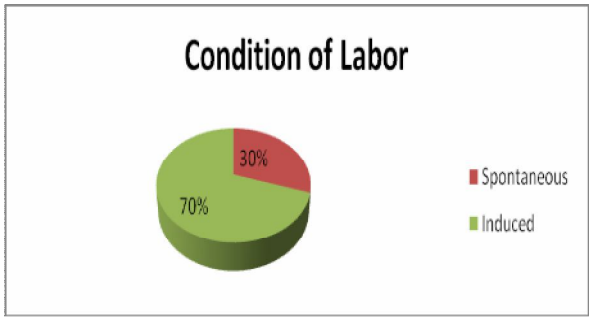

Figure 1. Pie chart showing condition of labor

Table VIII: 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

Table IX: Physical parameters of newborn baby

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

Table X: Frequency distribution of fetal outcome

Fetal outcome	Frequency	Percent
Meconium aspiration	5	10.0
RDS	19	38.0
Fetal deformity	3	6.0
Neonatal jaundice	4	8.0
Neonatal death	2	4.0
No deformity	17	34

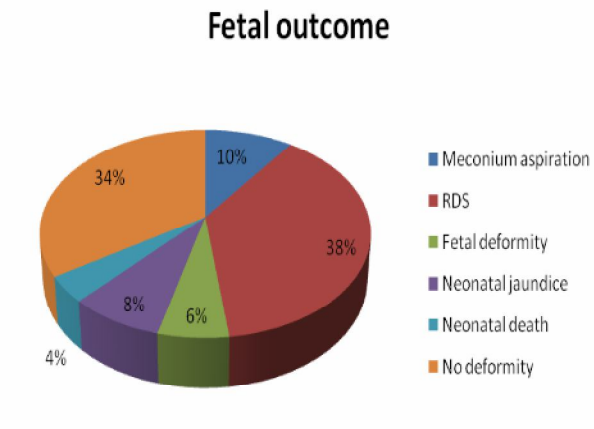

Figure 2. Pie chart showing fetal outcome

Discussion

In the present study Meconium stained amniotic fluid (MSAF) was associated fetal meconium aspiration (10.0%), fetal RDS (38.0%), fetal deformity (6.0%), and jaundice (8.0%). Among all babies 4.0% were expired.

Cialone et al found that meconium aspiration syndrome (MAS) occurs in 1-3% of all cases of MSAF and in 10-30% of neonates meconium is present below the vocal cords.[10] MAS is defined as meconium identified below the laryngeal cords with respiratory distress requiring oxygen or ventilation and with no evidence of sepsis.[11] Infants born through MSAF are 100 times more likely to develop respiratory distress compared to their counterparts born through clear amniotic fluid.[8] It is the particulate meconium (moderate or thick) which is associated with MAS and poor perinatal outcome. More than 90% develop MAS in patients with thick meconium, probably meconium of greater viscosity is more likely to pass below the cords.[12]

The presence of meconium is associated with higher incidences of abnormal labor, fetal distress, intervention in delivery and low APGAR score (Eriksen et al. 1994). Aspiration of meconium occurs as a result of hypoxia and hypercarbia which act synergistically to stimulate fetal gasping.[8,9]

The risk of perinatal death is increased five to seven times when a thick meconium is present at the onset of labour.[13] Infants with thin meconium are more likely to have passed meconium as a physiologic maturational process and they are more likely to be healthy at birth,[14] however, they still require intensive fetal monitoring.[15] In the present study, we did not divide the cases based on consistency of meconium.

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.

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