

Mode of delivery and fetal outcome in meconium stained amniotic fluid in DMCH

F Nesa¹, F Chowdhury², B H N Yasmeen³, S Rahman⁴, N Begum⁵, S A Hossain⁶

Abstract

Background : Meconium is a dark greenish mass of desquamated cells, mucus, and bile that accumulates in the bowel of a fetus and is typically discharged shortly after birth. Meconium stained amniotic fluid (MSAF) has long been considered to be a bad predictor of fetal outcome.

Objective : The aim of this study was to determine if the perinatal outcome is affected by mode of delivery in meconium-stained amniotic fluid.

Methodology : This observational study was carried out in the department of Obstetrics and Gynaecology in Dhaka Medical College Hospital from July 2016 to June 2017. A total of 204 women who satisfied the inclusion and exclusion criteria were taken for the study. The study group comprised of 102 women admitted in labour and having meconium stained amniotic fluid and 102 women in labour but having clear amniotic fluid were taken as comparison group.

Results : The mean age was found 26.6 ± 5.9 years in MSAF group and 26.2 ± 5.0 years in clear liquor group. The mean gestational age was found 38.9 ± 1.8 weeks in MSAF group and 38.5 ± 1.3 weeks in clear liquor group. Risk factors were not statistically significant ($p > 0.05$) between two groups. Forty-one (40.2%) patients had caesarian section in MSAF group and 19(18.6%) in clear liquor group. APGAR score at 1 minute and at 5 minute were statistically significant ($p < 0.05$) between two groups. About 100(98.0%) babies were alive in MSAF group and 101(99.0%) in clear liquor group.

Conclusion : Meconium stained amniotic fluid group was associated with higher rate of cesarean delivery, increased need for neonatal resuscitation, increased rate of PIH, pre-eclampsia, Oligohydramnios, IUGR, Post dated pregnancy, Rh incompatibility, GDM and long time hospital stay and hospital mortality.

Key words : Meconium, amniotic, gestational age liquor, caesarian section.

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Introduction

Meconium is a dark greenish mass of desquamated cells, mucus, and bile that accumulates in the bowel of a fetus and is typically discharged shortly after birth. Meconium stained amniotic fluid has long been considered to be a bad predictor of fetal outcome. Presence of meconium in amniotic fluid is a potentially serious sign of fetal compromise and associated with poor perinatal outcome.¹

The classical signs of fetal hypoxia are decreased fetal movements, variations in the heart rate patterns, presence of meconium in amniotic fluid, decrease in fetal scalp blood pH, etc. The significance of meconium in amniotic fluid as a sign of fetal distress is controversial. There are various theories ascribing it to different mechanisms. The pathological

explanation proposes that foetuses pass meconium in response to fetal hypoxia.²

Meconium staining of the amniotic fluid (MSAF) has reported less common in preterm labors (5%) but is more common in term (7-22%) and postterm deliveries (23-52%).³

Infants born through meconium-stained amniotic fluid are about 100 times more likely to develop respiratory distress than those which are born through clear fluid.⁴ Even in women who are at very low risk for obstetric complications, meconium-stained amniotic fluid is common and it is associated with a five-fold increase in perinatal mortality as compared with low-risk patients with clear amniotic fluid.⁴

Methodology

The observational study was carried out in the

¹Dr. Fazilatun Nesa
Associate Professor
Dept. of Obstetrics and
Gynecology
Northern International Medical
College

²Dr. Fahmida Chowdhury
Medical Officer
Dept. of Obstetrics and
Gynecology
Dhaka Medical College Hospital

³Prof. Dr. B.H. Nazma Yasmeen
MBBS, MCPS (Pediatrics)
MD (Pediatrics)
Professor and Head
Dept. of Pediatrics
Northern International Medical
College, Dhaka

⁴Dr. Shabnam Rahman
MBBS, FCPS (Gynae & Obs)
Assistant Professor
Dept. of Gynae & Obs.
Enam Medical College
Savar, Dhaka

⁵Dr. Nasreen Begum
Assistant Professor
Dept. of Community Medicine
Northern International Medical
College, Dhaka

⁶Prof. Dr. SK. Akbar Hossain
Professor & Head
Dept. of Community Medicine
Principal
Northern International
Medical College

Correspondence
Dr. Fazilatun Nesa
Associate Professor
Dept. of Obstetrics and
Gynecology
Northern International Medical
College
e-mail: fazilatun.naznin@gmail.com

department of Obstetrics and Gynaecology in Dhaka Medical College Hospital from July 2016 to June 2017.

A total of 204 women who satisfied the inclusion and exclusion criteria were taken for the study. The study group comprised of 102 women in labour with meconium stained amniotic fluid and 102 women in labour with clear amniotic fluid were taken as control group.

A structured questionnaire was administered for both cases and control group and it was same for all patients. Basic information's (demographic profile) about all the patients were filled up followed by specific answers to the questionnaires. Detailed information of maternal and fetal outcome was recorded.

Maternal outcome was measured by socio demography, history of home trial, presence of risk factors, Mode of delivery was recorded as spontaneous vaginal delivery, caesarean section and instrumental delivery (Forceps and ventouse).

Fetal outcome was measured by APGAR score at 1 and 5 minutes, weight, sex, development of meconium aspiration syndrome (MAS), requirement of neonatal resuscitation special care- baby unit admission, live birth, or neonatal death.

All babies were followed up maximum up to 7 days after delivery, collected data were compiled in a master sheet. comparison were made between clear amniotic fluid group and meconium stained group to find out if any difference could exist between the two groups regarding mode of delivery or fetal outcome.

Result

Mean age was found 26.6±5.9 years in MSAF group and 26.2±5.0 years in clear liquor group. Thirty-four (33.3%) patients received Ante natal care (ANC) regularly in MSAF group and 44 (43.1%) in clear liquor group. Fifty-one (50%) patients come from up to 3000-taka income in MSAF group and 56 (54.9%) in clear liquor group. Fifty-five (53.9%) patients were multi gravida in MSAF group and 54(52.9%) in clear liquor group. Mean gestational age was found 38.9±1.8 weeks in MSAF group and 38.5±1.3 weeks in clear liquor group. The difference were not statistically significant (p>0.05) between two groups (Table-I).

Risk factors were not statistically significant (p>0.05) between two groups (Table-II). Hypertensive disorders were not statistically significant (p >0.05) between two groups (Table- II).

Forty-one (40.2%) patients were caesarian section in MSAF group and 19(18.6%) in clear liquor group. The difference was statistically significant (p <0.05) between two groups (Table III).

APGAR score at 1 minute and at 5 minute were statistically significant between two groups (Table-IV). Seventeen (16.7%)

babies had admission in SCABU of MSAF group and 9(8.8%) of clear liquor group. The difference was not statistically significant between two groups (Table-V).

Nine (29.4%) babies was stay in SCABU >5 days in MSAF group but no one in clear liquor group. The difference was statistically significant (p<0.05) between two groups (Table-VI).

Hundred (98.0%) babies were alive in MSAF group and 101 (99.0%) in clear liquor group. The difference was not statistically significant between two groups (Table VII).

Table I : Demographic variable of the study patients

Demographic variable	MSAF (n=102)		Clear liquor (n=102)		p value
	n	%	n	%	
Age (year)					
<20	20	19.6	9	8.8	
21-25	32	31.4	43	42.2	
26-30	22	21.6	31	30.4	
>30	28	27.5	19	18.6	
Mean±SD	26.6	±5.9	26.2	±5.0	^a 0.648 ^{ns}
Antenatal checkup					
No ANC	35	34.3	21	20.6	
Irregular	33	32.4	37	36.3	^b 0.082 ^{ns}
Regular	34	33.3	44	43.1	
Socio-economic status/month					
Up to 3000	51	50.0	56	54.9	
Up to 7000	38	37.3	42	41.2	^b 0.074 ^{ns}
> 7000	13	12.7	4	3.9	
Gravida					
Primi	47	46.1	48	47.1	^b 0.888 ^{ns}
Multi	55	53.9	54	52.9	
Gestational age (weeks)					
37-38	38	37.3	51	50.0	
39-40	42	41.2	44	43.1	
41-42	22	21.6	7	6.9	
Mean±SD	38.9	±1.8	38.5	±1.3	^a 0.082 ^{ns}

s=significant, ns= not significant

^ap value reached from unpaired t-test

^bp value reached from chi square test

Table II : Risk factors of the study patients

Risk factors	MSAF (n=102)		Clear liquor (n=102)		p value
	n	%	n	%	
PIH	14	13.7	13	12.7	0.836 ^{ns}
Pre eclampsia	19	18.6	12	11.8	0.172 ^{ns}
Oligohydramnios	8	7.8	3	2.9	0.121 ^{ns}
IUGR	10	9.8	4	3.9	0.096 ^{ns}
Post dated pregnancy	12	11.8	5	4.9	0.076 ^{ns}
Rh incompatibility	1	1.0	1	1.0	0.751 ^{ns}
GDM	4	3.9	2	2.0	0.341 ^{ns}

ns= not significant

P value reached from chi square test

Table III : Mode of delivery of the study patients

Mode of delivery	MSAF		Clear liquor		p value
	(n=102)		(n=102)		
	n	%	n	%	
Normal	47	46.1	78	76.5	0.001 ^s
Forceps	2	2.0	0	0.0	
Vacuum extraction	12	11.8	5	4.9	
Caesarian section	41	40.2	19	18.6	

s= significant P value reached from chi square test

Table IV : Fetal outcome of the babies

Fetal outcome	MSAF		Clear liquor		p value
	(n=102)		(n=102)		
	n	%	n	%	
Sex					
Male	56	54.9	52	51.0	0.575 ^{ns}
Female	46	45.1	50	49.0	
Birth weight (kg)					
<2.5	23	22.5	13	12.7	0.066 ^{ns}
2.5-4.0	79	77.5	89	87.3	
APGAR score at 1 minute					
<7	59	57.8	17	16.7	0.001 ^s
>7	43	42.2	85	83.3	
APGAR score at 5 minute					
<7	18	17.6	5	4.9	0.004 ^s
>7	84	82.4	97	95.1	

s= significant, ns= not significant

P value reached from chi square test

Table V : Admission special care baby unit

Special care baby unit	MSAF		Clear liquor		p value
	(n=102)		(n=102)		
	n	%	n	%	
Admission of SCBU					
No	17	16.7	9	8.8	0.093 ^{ns}
Yes	85	83.3	93	91.2	
Indication for SCBU admission					
Birth asphyxia	8	7.8	3	2.9	0.009 ^s
Diarrhoea	2	2.0	0	0.0	
Small for date	3	2.9	3	2.9	
Meconium aspiration syndrome	2	2.0	0	0.0	
Neonatal jaundice	1	1.0	2	2.0	0.009 ^s
Observation	1	1.0	1	1.0	

ns= not significant P value reached from chi square test

Table VI : Stay in special care baby unit

Stay in special care baby unit (days)	MSAF		Clear liquor		p value
	(n=17)		(n=9)		
	n	%	n	%	
<3	3	17.6	7	77.8	0.009 ^s
3-5	9	52.9	2	22.2	
>5	5	29.4	0	0.0	

s= significant P value reached from chi square test

Table VII : Survivability of babies

Survivability	MSAF		Clear liquor		p value
	(n=102)		(n=102)		
	n	%	n	%	
Alive	100	98.0	101	99.0	0.223 ^{ns}
Still birth	0	0.0	1	1.0	
Neonatal death	2	2.0	0	0.0	

ns= not significant P value reached from chi square test

Discussion

In this study it was observed that mean age was found 26.6±5.9 years in MSAF group and 26.2±5.0 years in clear liquor group. Akhtar et al.⁵ showed that the mean age of mother was 26.2 ± 5.2 years. Gupta et al.⁶ found significant increased rate (86.7%) of meconium in amniotic fluid after 37 weeks. Mundhra and Agarwal study observed that approximately 50% cases had gestational ages of more than 40 weeks as compared to 14.2% controls who showed similar gestational ages, suggesting that advancing gestation increased meconium staining of amniotic fluid.⁴ Wong et al.⁷ and Karineimi and Harrela⁸ that socio-economic condition did not influence that MSAF in labour.

In our study it was observed that risk factors were not statistically significant (p>0.05) between the two groups. In Vaghela et al. study 59% patients had associated obstetric risk factors like PIH, post-datism, oligohydramnios, PROM.¹ Out of this 13% patients had PIH. Bhide et al. found 13.8% having PIH.⁹

In this present study it was observed that hypertensive disorders was not statistically significant (p>0.05) between two groups. Mundhra and Agarwal⁴ pregnancy induced hypertension (PIH) was associated with MSAF, but the incidence in our study was 16.97%, unlike the incidence of 13% in studies of Bhide et al.⁹ and Khatun et al.¹⁰

In this study it was observed that 41(40.2%) patients had caesarian section in MSAF group and 19(18.6%) in clear liquor group. The difference was statistically significant (p<0.05) between two groups. Mundhra and Agarwal study observed that caesarean section was very commonly done in MSAF cases and it accounted for 49.09% cases as compared to 25.79% cases in control group, rates being nearly double and difference being statistically significant.⁴ In contrast to our study, Wong et al. found that 13.2% of MSAF had undergone caesarean sections as compared to 8.8% cases who had undergone them in clear amniotic fluid.⁷ Such lower rates of caesarean section could be due to incorporation of scalp pH sampling in their study, unlike ours. Naveen et al. also reported a caesarean section rate of 49.1% in MSAF.¹¹

In this series it was observed that APGAR score at 1 minute and at 5 minute were statistically significant ($p < 0.05$) between the two groups. Present Vaghela et al. study shows birth weight of 2.6-3 kg in majority of patients.¹ Sedaghatian et al. observed similar result in their study.¹² Akhtar et al. found that 77.5% babies had birth weight > 2.5 kg.¹ Patil et al. observed that 6.74% of patients within meconium and 26.25% of patients with thick meconium had low (< 7) APGAR score.¹³ Another study has also found the higher proportion of LBW babies in MSAF group like Narang et al. 24.4%. Mundhra and Agarwal study showed infants with MSAF had low APGAR scores at birth and 21.21% cases needed intensive care unit admissions.¹⁴ Patil et al. reported that 19% babies with MSAF had unsatisfactory APGAR scores.¹³

In this study it was observed that 17(16.7%) babies were admission of SCBU in MSAF group and 9(8.8%) in clear liquor group. The difference was not statistically significant ($p > 0.05$) between two groups. Vaghela et al. study observed that NICU admission was required in 30 cases.¹ Birth asphyxia, aspiration pneumonia, respiratory distress syndrome and febrile illness contribute to perinatal morbidity. Perinatal mortality was 5%. Mundhra and Agarwal study showed meconium aspiration was seen in 5 cases and 5 babies who were born to cases had early neonatal deaths, though the difference was not statistically significant as compared to controls.⁴ Incidence of birth asphyxia and NICU admissions were statistically higher among babies born to cases as compared to those who were born to control group.

In this current study it was observed that 9(29.4%) babies was stay in SCBU > 5 days in MSAF group and not found in clear liquor group. The difference was statistically significant ($p < 0.05$) between two groups. Vaghela et al. study showed out of 13 new-born having APGAR score < 7 at 1 minute, 8 improved with resuscitation and 5 neonates needed NICU admission.¹

In this present study it was observed that 100(98.0%) babies were alive in MSAF group and 101(99.0%) in clear liquor group. The difference was not statistically significant ($p > 0.05$) between two groups. Gupta et al. found 4.9% of MSAF babies to have neonatal death as compared to 2.8% in clear liquor babies.⁶

Conclusion

In this study we found that Meconium stained amniotic fluid was associated with higher rate of cesarean delivery, increased need for neonatal resuscitation, increased rate of PIH, pre-eclampsia, Oligohydramnios, IUGR, Post dated pregnancy, Rh incompatibility, GDM and longtime hospital stay and hospital mortality.

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