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Original Research Article

Pregnancy Outcome and Early Neonatal Morbidities among Women in Labour with Meconium Stained Liquor: A Prospective Observational Study in a Peripheral Tertiary Health Care Facility in West Bengal

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Abstract

Background: In this study we wanted to evaluate the incidence of deliveries with meconium stained liquor and assessment of early neonatal morbidities, assess the mode of delivery in meconium stained liquor**,** ascertain the correlates of meconium stained delivery and study the effects of meconium stained liquor on the babies in terms of early neonatal morbidities.

Materials and Methods: This was a hospital based prospective observational study conducted among 96 parturients with meconium-stained liquor at the Department of Obstetrics and Gynecology & in Emergency, Deben Mahata Sadar Hospital (now Deben Mahata Government Medical College), Purulia from 1st January 2018 to 31st December 2018, after obtaining clearance from the Institutional Ethics Committee and written informed consent from the study participants.

Results: Maximum patients (66.7%) of meconium stained liquor were nullipara (para 0) and the most common age group in MSAF (meconium stained amniotic fluid) patients was found to be ≤ 20 years. We found that 27.1% of patients had thick meconium and 72.9% of patients had thin meconium. In 96 MSAF patients, 50.0% of patients were delivered by VD, LSCS was done in 40.6% of patients and 9.4% of patients were delivered by instrumental delivery. In our study, 68.8% of newborns had a birth weight of 2.5-3.5 kg and 29.2% of newborns needed admission to SNCU. The association between FHR abnormality and type of meconium was statistically significant. In thin meconium, VD was significantly higher and in thick meconium, the LSCS rate was significantly higher. In the presence of FHR abnormality, 92.9% of patients were delivered by LSCS. The association between Apgar scores at 1 min and 5 min. vs. type of meconium was statistically significant. The association between early neonatal complications and type of meconium was statistically significant.

Conclusion: Most of the newborns born through MSAF have normal birth weights. Early neonatal mortality is increased in pregnant women with MSAF as evidenced by the low Apgar score at 1 min and 5 min, increased SNCU admission, increased duration of stay in SNCU, more neonatal complications and higher neonatal mortality. Thin meconium is more common

in labour and is a less detrimental effect on a newborn than thick meconium. In the presence of thick meconium, there is increased instrumental vaginal delivery and caesarean section rates, low Apgar score at 1 min & 5 min, more SNCU admission, increased duration of stay in SNCU, more early neonatal complications mainly MAS and birth asphyxia and higher neonatal death than thin meconium. Thus, we found that MSAF is associated with poor perinatal outcomes. Therefore, early detection of meconium, prompt early intervention and neonatal resuscitation by a skilful neonatologist are strongly recommended for the improvement of perinatal outcomes.

Keywords: Pregnancy Outcome, Early Neonatal Morbidities among Women, Meconium Stained Liquor..

Introduction

Meconium is a viscous green black semisolid substance that consists of water, lipids, denuded intestinal epithelial cells, digestive secretions, cellular debris, lanugo hair, vernix caseosa, steroids, sterols, bile acids and sometimes occult blood. [1] Meconium passage in newborn infants is a developmentally programmed event normally occurring within the first 24 to 48 hours after birth. Intrauterine meconium passage in the near term or term fetuses has been associated with fetomaternal stress factors and/or infection, whereas meconium passage in post term pregnancies has been attributed to gastrointestinal maturation. [2] Obstetricians and midwives even in the ancient days of Hippocrates were concerned about the grave outcome of labour when liquor was meconium stained. Contrary to the earlier belief that passage of meconium was a sure sign of fetal death, meconium stained amniotic fluid (MSAF) is noted in approximately 12% to 16% of all deliveries. Meconium aspiration syndrome (MAS) is noted in 5% of these infants and more than 4% of MAS infants died accounting for 2% of all perinatal deaths. [3] Even in women who are at very low risk for obstetric complications, meconium stained amniotic fluid is common and it is associated with a fivefold increase in perinatal mortality as compared with low risk patients with clear amniotic fluid. [4] Meconium is passed into the amniotic fluid by peristalsis of the fetal gut accompanied by relaxation of internal and external anal sphincters. Meconium is found in the fetal gut from 10 weeks of gestation, but the passage of meconium is rare before 34 weeks. After 34 weeks, the incidence of meconium passage increases with gestational age and reaches approximately 30% at 40 weeks and 50% at 42 weeks. [5,6] The presence of meconium in amniotic fluid may reflect fetal gastrointestinal maturity or foetal hypoxia following vagal stimulation from transient umbilical cord entrapment and resultant increased peristalsis. Aspiration of meconium into the fetal or neonatal lung is associated with clinical diseases ranging from mild respiratory distress to severe respiratory compromise.

Meconium aspiration is commonly defined as the presence of meconium below vocal cords. Meconium aspiration is more common if the meconium is thick rather than thin. With the decline in maternal mortality & morbidity over the past few decades, modern obstetricians are much more concerned about the well-being of the fetus. Management of labour complicated by MSAF is still a widely debated subject. Many obstetricians consider it an ominous sign to continue labour. Amnioinfusion was introduced as an important intervention to prevent MAS, but with time opinion

regarding its beneficial effects seems to be divided. There is also controversy regarding intrapartum suctioning of the newborn and endotracheal intubation and suctioning. MSAF is still associated with increased incidence of cesarean section, instrumental vaginal delivery and adverse neonatal outcomes. So, the present study is carried out to describe the type of MSAF, mode of delivery and early neonatal outcomes of pregnancies complicated by MSAF.

Aims and Objectives

1. To assess the mode of delivery in meconium stained liquor.
2. To ascertain the correlates of meconium stained delivery and the effect of meconium stained liquor on the babies in terms of early neonatal morbidities.

Materials and Methods

This was a hospital based prospective observational study conducted among 96 parturients with meconium-stained liquor at the Department of Gynaecology & in Emergency, Deben Mahata Sadar Hospital (now Deben Mahata Government Medical College), Purulia from 1st January 2018 to 31st December 2018, after obtaining clearance from the Institutional Ethics Committee and written informed consent from the study participants.

Inclusion Criteria

1. **Term live pregnancy**
2. Singleton pregnancy with cephalic presentation

Exclusion Criteria

1. Pregnancy with antepartum haemorrhage
2. Pregnancy with previous LSCS (Lower Segment Cesarean Section)
3. Pregnancy with congenital malformation of fetus
4. High risk pregnancies or pregnancies with medical complications

Sample Size

The sample size for the proposed study may be calculated as it is done for any incidence study based on the following formula:

$n = (z/e)^2$

Where

e = relative precision which was 10% of a prevalence of 18.66% incidence of neonatal death in meconium-stained liquor deliveries,[7]

z=1.96 (two-tailed) at 95% confidence interval.

Now, $n = (1.96/0.2)^2 = 96$

Statistical Methods

Analysis and interpretation of the collected data were done using appropriate statistical methods. Data were tabulated in a Microsoft excel sheet and all analysis was performed by SPSS Version 24.0 and graph pad prism version 5. Descriptive statistical methods were used for describing. Data display was done with the help of tables. Continuous variables were presented as mean and standard deviation, and the result of categorical variables was presented as percentage/proportion. Inferential statistics e.g. unpaired t-test, chi-square test; Odds ratio with its 95% confidence interval (CI) etc. was used to establish a relation between input & outcome variables. If the calculated p-value was ≤ 0.05 it was considered to be statistically significant.

Results

In MSAF patients, 38(39.6%) patients were ≤ 20 years of age, 32(33.3%) patients were 21-25 years of age, 13(13.5%) patients were 26-29 years of age, 9(9.4%) patients were 30-34 years of age and 4(4.2%) patients were ≥ 35 years of age. The mean age (mean ± SD) of patients was 23.65±5.11 years with a range of 19.00-37.00 years and the median age was 21.00 years [Table 1].

Table 1: Distribution of age in MSAF patients

Age	Frequency	Percent
≤ 20 Years	38	39.6%
21-25 Years	32	33.3%
26-29 Years	13	13.5%
30-34 Years	9	9.4%
≥ 35 Years	4	4.2%
Total	**96**	**100.0%**

Maximum patients were from rural areas (73 patients, 76.0%) while 23(24.0%) patients were from urban areas. 32 (33.3%) patients were booked and 64 (66.7%) patients were unbooked. Most of the patients had unbooked ANC (Antenatal care) status. 64(66.7%) patients were nullipara, 19(19.8%) patients were para 1, 8(8.3%) patients were para 2, 5(5.2%) patients were para ≥3. Parity distribution showed a maximum number of patients (66.7%) with meconium stained liquor as nullipara (Para 0). Twelve (12.5%) patients were 37-37.6 weeks, 24(25.0%) patients were 38-38.6 weeks, 35(36.5%) patients were 39-39.6 weeks, 16 (16.7%) patients were 40-40.6 weeks and 9 (9.4%) patients were 41-42 weeks of gestation age [Table 2].

Table 2: Distribution of other demographic parameters including period of gestation (POG) in MSAF patients

Resident	**Frequency**	**Percent**
Rural	73	76.0%
Urban	23	24.0%
Total	96	100.0%
Distribution of residents in MSAF patients		
ANC status	**Frequency**	**Percent**
Booked	32	33.3%
Unbooked	64	66.7%
Total	96	100.0%
Distribution of ANC status in MSAF patients		
Parity	**Frequency**	**Percent**
Para 0	64	66.7%
Para 1	19	19.8%
Para 2	8	8.3%
Para ≥3	5	5.2%
Total	96	100.0%
Distribution of parity in MSAF patients		
POG	**Frequency**	**Percent**
37-37.6 Weeks	12	12.5%
38-38.6 Weeks	24	25.0%
39-39.6 Weeks	35	36.5%
40 – 40.6 Weeks	16	16.7%
41-42 Weeks	9	9.4%
Total	96	100.0%

Among the study group 26(27.1%) patients had thick meconium and 70(72.9%) patients had thin meconium. 28(29.2%) patients had the presence of FHR

abnormality. 8(50.0%) patients were delivered by VD, LSCS was done in 39(40.6%) patients and 9(9.4%) patients had an instrumental vaginal delivery. Most patients were delivered by VD but there was also a 40.6 % LSCS rate. 25(26.0%) newborns had <2.5 kg birth weight, 66(68.8%) newborns had 2.5 to 3.5 kg birth weight and 5(5.2%) newborns had >3.5 kg birth weight. Most of the babies (68.8%) had a birth weight of 2.5-3.5 kg. The mean birth weight (mean ± SD) of the newborn was 2.7927 ± .4404 kg with a range of 1.900-3.800 kg and the median birth weight was 2.800 kg.

31(32.3%) newborns had <7 Apgar score at 1 min and 65(67.7%) newborns had ≥7 Apgar score at 1 min. 32.3 % of babies had a low Apgar score at 1 min [Table 3].

Table 3: Showing distribution of type of meconium, FHR abnormality, mode of delivery, birth weight and Apgar score at 1 min of birth.

Type of meconium	**Frequency**	**Percent**
Thick	26	27.1%
Thin	70	72.9%
Total	96	100.0%
Distribution of type of meconium		
FHR abnormality	**Frequency**	**Percent**
Yes	28	29.2%
No	68	70.8%
Total	96	100.0%
Distribution of FHR abnormality in MSAF patients		
Mode of delivery	**Frequency**	**Percent**
VD	48	50.0%
LSCS	39	40.6%
Instrumental	9	9.4%
Total	96	100.0%
Distribution of mode of delivery in MSAF patients		
Birth weight	**Frequency**	**Percent**
<2.5 Kg	25	26.0%
2.5 to 3.5 Kg	66	68.8%
>3.5 Kg	5	5.2%
Total	96	100.0%
Distribution of birth weight in MSAF patients		
Apgar score at 1 min.	**Frequency**	**Percent**
<7	31	32.3%
≥7	65	67.7%
Total	96	100.0%

In our study 20(20.8%) newborns had <7 Apgar score at 5 min and 76(79.2%) newborns had ≥7 Apgar score at 5 min. Most of the babies were vigorous having 5-minute Apgar score ≥**7** in 79.2 % of babies. 28(29.2%) newborns needed admission to SNCU born through MSAF patients. 68(70.8%) newborns did not require admission to SNCU. 83(86.5%) newborns had <7 days stay in SNCU and 13(13.5%) newborns had ≥7 days stay in SNCU. Most newborns did not require admission to SNCU for≥7 days [Table 4].

Table 4: Distribution of neonatal parameters

Apgar score at 5 min.	**Frequency**	**Percent**
<7	20	20.8%
≥7	76	79.2%
Total	96	100.0%
Distribution of Apgar score at 5 min. of birth		
Admission to SNCU	**Frequency**	**Percent**
Yes	28	29.2%
No	68	70.8%
Total	96	100.0%
Distribution of admission to SNCU		
Duration of stay in SNCU	**Frequency**	**Percent**
<7 Days	83	86.5%
≥7 Days	13	13.5%
Total	96	100.0%
Distribution of duration of stay in SNCU		
Early neonatal complications	**Frequency**	**Percent**
Birth asphyxia	12	12.5%
MAS	5	5.2%
Neonatal jaundice	3	3.1%
Sepsis	2	2.1%
No complications	74	77.1%
Total	96	100.0%
Distribution of early neonatal complications		
Neonatal death	**Frequency**	**Percent**
Yes	6	6.25%
No	90	93.75%
Total	96	100.0%

12(12.5%) newborns had birth asphyxia, 5(5.2%) newborns had MAS, 3(3.1%) newborns had neonatal jaundice, 74(77.1%) newborns had no neonatal complications and 2(2.1%) patients had sepsis. The most common early neonatal complication in MSAF was birth asphyxia. In 96 newborns born with MSAF patients, neonatal death was found in 6(6.25%) [Table 4].

Table 5: Association between different parameters and type of meconium

Type of meconium			
FHR abnormality	**Thick**	**Thin**	**Total**
Yes	15	13	28
Row %	53.6	46.4	100.0
Col %	57.7	18.6	29.2
No	11	57	68
Row %	16.2	83.8	100.0
Col %	42.3	81.4	70.8
TOTAL	26	70	96
Row %	27.1	72.9	100.0
Col %	100.0	100.0	100.0
Association between FHR abnormality and type of meconium (Chi-square value: 14.0441; p-value: 0.00017)			

Type of meconium			
Mode of delivery	**Thick**	**Thin**	**Total**
VD	6	42	48
Row %	12.5	87.5	100.0
Col %	23.1	60.0	50.0
LSCS	17	22	39
Row %	43.6	56.4	100.0
Col %	65.4	31.4	40.6
Instrumental	3	6	9
Row %	33.3	66.7	100.0
Col %	11.5	8.6	9.4
TOTAL	26	70	96
Row %	27.1	72.9	100.0
Col %	100.0	100.0	100.0
Association between mode of delivery and type of meconium (Chi-square value: 10.7280; p-value: 0.0047)			
Mode of delivery			
FHR abnormality	**Instrumental**	**LSCS**	**VD**	**Total**
Yes	2	26	0	28
Row %	7.1	92.9	0.0	100.0
Col %	22.2	66.7	0.0	29.2
No	7	13	48	68
Row %	10.3	19.1	70.6	100.0
Col %	77.8	33.3	100.0	70.8
TOTAL	9	39	48	96
Row %	9.4	40.6	50.0	100.0
Col %	100.0	100.0	100.0	100.0
Association between FHR abnormality and mode of delivery (Chi-square value: 46.5210; p-value: <0.0001)				
Type of meconium			
Apgar score at 1 min.	**Thick**	**Thin**	**Total**
< 7	13	18	31
Row %	41.9	58.1	100.0
Col %	50.0	25.7	32.3
≥ 7	13	52	65
Row %	20.0	80.0	100.0
Col %	50.0	74.3	67.7
TOTAL	26	70	96
Row %	27.1	72.9	100.0
Col %	100.0	100.0	100.0
Association between Apgar scores at 1 min. and type of meconium (Chi-square value: 5.1141; p-value: 0.0237)			
Type of meconium			
Apgar score at 5 min.	**Thick**	**Thin**	**Total**
< 7	10	10	20
Row %	50.0	50.0	100.0
Col %	38.5	14.3	20.8

≥	**7**	16	60	76
Row	%	21.1	78.9	100.0
Col %		61.5	85.7	79.2
TOTAL		26	70	96
Row	%	27.1	72.9	100.0
Col %		100.0	100.0	100.0
Association between Apgar scores at 5 min. and type of meconium (Chi-square value: 6.7183; p-value: 0.0095)				

In thick meconium, 15 (57.7%) patients had FHR abnormalities. In thin meconium, 13 (18.6%) patients had FHR abnormality. In thick meconium, FHR abnormality was significantly higher than in thin meconium. The association between FHR abnormality and type of meconium was statistically significant (p=0.00017) [Table 5].

In thick meconium, 6 (23.1%) patients were delivered by VD, 3 (11.5%) patients had instrumental delivery and 17 (65.4%) patients had LSCS. In thin meconium, 42 (60.0%) patients were delivered by VD, 6 (8.6%) patients had instrumental delivery and 22 (31.4%) patients had LSCS. In thin meconium, VD was significantly higher and in thick meconium, LSCS rates were significantly higher. The association between mode of delivery and type of meconium was statistically significant (p=0.0047) [Table 5].

92.9% of patients were delivered by LSCS. In the absence of FHR abnormality, 70.6% of patients were delivered by VD. There was a strong association between the presence of FHR abnormality and delivery by LSCS. The association between FHR abnormality and mode of delivery was statistically significant (p<0.0001) [Table 5].

In thick meconium, 13(50.0%) newborns had <7 Apgar scores at 1 min and 13(50.0%) newborns had ≥ 7 Apgar scores at 1 min. In thin meconium, 18(25.7%) newborns had <7 Apgar score at 1 min and 52(74.3%) newborns had ≥ 7 Apgar score at 1 min. In thick meconium, newborns with the low Apgar score at 1 min. were significantly higher than in thin meconium. The association between Apgar score at 1 min and type of meconium was statistically significant (p=0.0237) [Table 5].

In thick meconium, 10(38.5%) newborns had <7 Apgar score at 5 min and 16(61.5%) newborns had ≥ 7 Apgar score at 5 min. In thin meconium, 10(14.3%) newborns had <7 Apgar score at 5 min and 60 (85.7%) newborns had ≥7 Apgar score at 5 min. Newborns with Apgar score <7 at 5 min were significantly higher in thick meconium than thin meconium. Association between Apgar scores at 5 min. and type of meconium was statistically significant (p=0.0095) [Table 5].

Table 6: Association between different neonatal parameters and type of meconium

Type of meconium			
Admission to SNCU	**Thick**	**Thin**	**Total**
Yes	12	16	28
Row %	42.9	57.1	100.0
Col %	46.2	22.9	29.2
No	14	54	68
Row %	20.6	79.4	100.0
Col %	53.8	77.1	70.8
Total	26	70	96
Row %	27.1	72.9	100.0
Col %	100.0	100.0	100.0
Association between admission to SNCU and type of meconium (Chi-square value: 4.9804; p-value: 0.0256)			

Type of meconium			
Duration of stay in SNCU	**Thick**	**Thin**	**Total**
<7 days	18	65	83
Row %	21.7	78.3	100.0
Col %	69.2	92.9	86.5
≥7 days	8	5	13
Row %	61.5	38.5	100.0
Col %	30.8	7.1	13.5
Total	26	70	96
Row %	27.1	72.9	100.0
Col %	100.0	100.0	100.0
Association between duration of stay in SNCU and type of meconium (Chi-square value: 9.0389; p-value: 0.0026)			

Type of meconium			
Early neonatal complications	**Thick**	**Thin**	**Total**
Birth asphyxia	6	6	12
Row %	50.0	50.0	100.0
Col %	23.1	8.6	12.5
MAS	4	1	5
Row %	80.0	20.0	100.0
Col %	15.4	1.4	5.2
Neonatal jaundice	1	2	3
Row %	33.3	66.7	100.0
Col %	3.8	2.9	3.1
Sepsis	1	1	2
Row %	50.0	50.0	100.0
Col %	3.8	1.4	2.1
No complications	14	60	74
Row %	18.9	81.1	100.0
Col %	53.8	85.7	77.1
total	26	70	96
Row %	27.1	72.9	100.0
Col %	100.0	100.0	100.0
Association between early neonatal complications and type of meconium (Chi-square value: 13.3699; p-value: 0.0096)			

Type of meconium			
Neonatal death	**Thick**	**Thin**	**Total**
Yes	4	2	6
Row %	66.7	33.3	100.0
Col %	15.4	2.9	6.3
No	22	68	90
Row %	24.4	75.6	100.0
Col %	84.6	97.1	93.8
TOTAL	26	70	96
Row %	27.1	72.9	100.0
Col %	100.0	100.0	100.0
Association between neonatal death and type of meconium (Chi-square value: 5.0778; p-value: 0.0242)			

In thick meconium, 12 (46.2%) newborns were admitted to SNCU. In thin meconium, 16 (22.9%) newborns were admitted to SNCU. In thick meconium admission to SNCU was significantly higher than in thin meconium. The association between admission to SNCU and type of meconium

was statistically significant (p=0.0256) [Table 6].

In thick meconium, 30.8% of newborns had ≥ 7-day stay in SNCU. In thin meconium, only 7.1% of newborns had ≥7 days of stay in SNCU. Duration of stay in SNCU **≥7** days was significantly higher in thick meconium. The association between duration of stay in SNCU and type of meconium was statistically significant (p=0.0026) [Table 6].

In thick meconium, 6 (23.1%) newborns had birth asphyxia, 4 (15.4%) newborns had MAS, 1 (3.8%) newborn had neonatal jaundice and 1 (3.8%) newborn had sepsis. In thin meconium, 6 (8.6%) newborns had birth asphyxia, 1 (1.4%) newborn had MAS, 2 (2.9%) newborns had neonatal jaundice and 1 (1.4%) newborn had sepsis. MAS and birth asphyxia were common complications in thick meconium. In thick meconium, early neonatal complications were significantly higher. The association between early neonatal complications and type of meconium was statistically significant (p=0.0096) [Table 6].

In thick meconium, 4 (15.4%) newborns had neonatal death. In thin meconium, 2 (2.9%) newborns had neonatal death. Neonatal death was significantly higher in thick meconium. Death of newborns in MSAF patients was significantly higher in thick meconium. The association between neonatal death and type of meconium was statistically significant (p=0.0242) [Table 6].

Discussion

The mean age (mean ± SD) of patients in the present study was 23.65±5.11 years with a range of 19-37 years. The percentage of women < 20 years was 39.6% and of the age >35 years was 4%. The rest of the patients were in the 21-35 years age group. Vaghela HP et al [8] found that 74% of patients were in the age group 21-30 years which is similar to our study. The highest incidence of MSAF was noted in primigravida (66.7%). The present study is correlating with the study done by Mohan M et al [9] (69.3%) and Gokhroo K et al [10] (54%). This may be due to the increased duration of labour. However, in the study done by Mundhra R et al, [11] a slightly higher incidence of MSAF was seen in multigravida (51.52%). In the present study, 27.1% of patients had thick meconium and 72.9% of patients had thin meconium which is similar to a study done by Samiyappa DP et al [12] (27% thin vs. 73% thick). Unnisa S et al [13] found that 55.4% were thin stained & 44.5% were thickly stained.

In the present study, 32.3% & 20.8% of newborns were <7 Apgar scores at 1 min, and 5 min. respectively. Sundaram R et al [14] also found that 38% & 16% newborns were <7 Apgar score at 1 min. and 5 min. respectively which was similar to our study. We also found that 12.5% of newborns had birth asphyxia, MAS in 5.2%, neonatal jaundice in 3.1%, 77.1% of newborns were asymptomatic and 2.1% patients had sepsis. The association between mode of delivery and type of meconium was statistically significant (p=0.0047). Qadir S et al [15] found that on comparing the subgroups of thick and thin meconium. We also found that the association between FHR abnormality and mode of delivery was statistically significant (p<0.0001). In the present study, a low Apgar score at 1 and 5 minutes was more often noted in cases with thick meconium. [16] Low Apgar scores were noted at 50.0% and 38.5% at 1min. and 5 min. respectively in cases with thick meconium compared to cases with thin meconium (38.5% vs. 14.3%) which was statistically significant (p-value of 0.043). We found that the association between admission to SNCU and the type of meconium was statistically significant (p=0.0256). In our study, 30.8% of newborns in the thick meconium group had ≥ 7-days stay in SNCU and only 7.1% of newborns with thin meconium had ≥ 7-days stay in SNCU. Duration of stay in SNCU ≥7 days was significantly higher in thick meconium. The association between

duration of stay in SNCU and type of meconium was statistically significant (p=0.0026). We found that in the presence of thick meconium, neonatal death was 15.4%. In thin meconium, neonatal death was only 2.9%. The association between neonatal death and type of meconium was statistically significant (p=0.0242).

Conclusion

MSAF is more common in primigravida women, more common in the 39-39.6 week's gestational age group and more common in the younger age group (≤ 20 years). Thin meconium is more common in labour and is a less detrimental effect on a newborn than thick meconium. MSAF is more associated with intrapartum FHR abnormality and needed more operative intervention (instrumental vaginal delivery and LSCS). Most of the newborns born through MSAF have normal birth weights. Early neonatal mortality is increased in pregnant women with MSAF as evidenced by the low Apgar score at 1 min and 5 min, increased SNCU admission, increased duration of stay in SNCU, more neonatal complications and higher neonatal death. There is no significant correlation between parity, gestational age and type of meconium-stained liquor. FHR abnormality, instrumental vaginal delivery and caesarean section rates are significantly increased when liquor is thick meconium stained rather than thin meconium in labour. In the presence of FHR abnormality, most pregnant women with MSAF are delivered by LSCS irrespective of the type of meconium. There is no significant correlation between birth weight and type of meconium. In the presence of thick meconium, there is a low Apgar score at 1 min & 5 min, more SNCU admission, increased duration of stay in SNCU, more early neonatal complications mainly MAS and birth asphyxia and higher neonatal death than thin meconium.

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