Research Article

The Prevalence of Meconium Stained Amniotic Fluid and its Associated Factors Among Women Who Gave Birth at Term in Adama Hospital Medical College, Adama, Ethiopia

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ABSTRACT

Background: In day-to-day practice of obstetrics, meconium stained amniotic fluid is a commonly observed phenomenon. Various risk factors that may cause stress on the fetus which lead to meconium stained amniotic fluid. This study aimed to determine the prevalence of meconium stained amniotic fluid and its associated factors among women who gave birth at term.

Methods: A cross-sectional study was conducted on 314 laboring women at Adama Hospital Medical College, Southeast Ethiopia. Systematic random sampling technique was used to select the study participants. Epi- info 7 and SPSS version 20 were used for data entry and analysis.

Results: The prevalence of meconium stained amniotic fluid was 23.9% (95% confidence interval (CI) 19.1–29.3%). Late term pregnancy (AOR=8.82; 95% CI: 3.18-24.49), Oligohydraminos (AOR=5.09; 95% CI: 1.29-20.03), Antepartum hemorrhage (AOR=8.43; 95% CI: 2.02 - 35.17), Premature rupture of membrane (AOR= 10.06; 95% CI: 1.27-79.98), and Non-reassuring fetal heart rate pattern (AOR=4.78; 95% CI: 1.64-13.98) were significantly associated with meconium stained amniotic fluid.

Conclusions: The prevalence of meconium stained amniotic fluid was high. Late term pregnancy, oligohyraminos, ante-partum hemorrhage, non-reassuring fetal heart rate pattern, and premature rupture of the membrane were factors associated with an increased risk for meconium stained amniotic fluid.

Keywords: Meconium stained amniotic fluid, Prevalence, Associated factors.

INTRODUCTION

Meconium is a germ-free, thick, black-green, odorless material which is first recognized in the fetal intestine around 12 weeks of gestation [1]. Passage of meconium in newborn infant is a developmentally programmed incident; normally occurring within the first 24 h to 48 h after birth. However, the fetus may pass meconium in the amniotic fluid during pregnancy due to different reasons [2]. The passage of meconium in utero has been described by various authors by different mechanisms. The three theories that have been suggested for fetal passage of meconium include; in response to vagal stimulation, it may represent normal gastrointestinal tract maturation, and due to fetal hypoxia [3,4].

The passage of meconium in utero occurs in 7%-22% of all term deliveries [5]. The exact etiology of the passage of meconium in utero remains unclear [6]. Several risk factors that may cause stress on the fetus which lead to MSAF are: advanced gestational

age at delivery, increased duration of Rupture of Membranes (ROM), prolonged second stage of labor, intra-amniotic infection, placental insufficiency, maternal hypertension, pre-eclampsia, oligohydroamnios, IUGR, GDM, overt diabetes mellitus, and maternal drug abuse (tobacco or cocaine) are associated with meconium staining of amniotic fluid [7-9].

Meconium Stained Amniotic Fluid (MSAF) is an alarming sign of fetal compromise and associated with a poor perinatal outcome [10]. MSAF predisposes perinatal mortality even in women with a very low risk for obstetric complications. Fetal and neonatal complications associated with MSAF include; increased risk of birth asphyxia and fetal distress, low birth weight, low Apgar scores, increased need for Neonatal Resuscitation, Increased Incidence of Neonatal Intensive Care Unit (NICU) admission, meconium aspiration syndrome and early neonatal death. In deliveries complicated with MSAF, there is an increased risk of caesarean section, instrumental delivery, chorioamnionitis, and puerperal sepsis which results in higher morbidity and mortality in mothers [11-13].

Since MSAF is associated with an increased risk to the fetus and neonates, identifying the risk factors is essential for early identification and intervention. This study was done to assess the magnitude of MSAF among term deliveries and to identify the associated risk factors with meconium stained deliveries. Since there was limited information about the issue in the study area, the study generates valuable evidence which helps clinicians and other health care providers to improve their practices.

The objective of the study was to determine the prevalence of meconium stained amniotic fluid and its associated factors among women who gave birth at term in Adama Hospital Medical College (AHMC), Department of Obstetrics and Gynecology, from January 1st to July 30th, 2020.

MATERIALS AND METHODS

Aim, design and setting of the study

The aim of the study was to assess the magnitude of meconium stained amniotic fluid and its associated factors among mothers who gave birth at term. Hospital based cross-sectional study was conducted at Adama Hospital Medical College (AHMC), Department of Obstetrics and Gynecology, Obstetrics ward from January 1st to July 30th, 2020. AHMC is the only specialized referral and teaching hospital under the Oromia Regional Health Bureau and located in the Oromia region, Adama town, which is located about 100 km southeast of the capital city, Addis Ababa. AHMC is one of the top ten governmental hospitals in Ethiopia. The Hospital provides different specialty services to over 5 million people coming from the catchment area. The labor ward gives services to around 750 deliveries per month. The Department of Obstetrics and Gynecology has a labor ward with 12 beds in the first stage room, 8 delivery couches in the second stage room, 2 operation tables, and 38 beds in the maternity ward. The ward is staffed with 9 obstetrics and gynecology specialists, 51 midwives, 4 clinical nurses, 34 residents, and a varying number of medical interns.

Characteristics of the study participants

All women who gave birth at term in Adama Hospital Medical College (AHMC) were considered as the source population. All pregnant women whose gestational age was between 37 and 41+6 completed weeks singleton pregnancies with cephalic presentation

and with no known fetal congenital anomalies were included in the study. Those with preterm preterm pregnancy, post-term pregnancy, and unknown gestational age were excluded from the study.

Sample size and sampling procedure

The required sample size was determined by using a single population proportion formula, considering the prevalence of MSAF was 24.6% from the previous study done in Felege Hiwot Referral Hospital, northwest Ethiopia [14]. The statistical assumptions required for determining the sample size were a 95% level of confidence, 5% margin of error, and 10% nonresponse rate. Accordingly, 314 women were sampled for the current study. To select the required number of clients, a systematic random sampling technique was used.

Data collection tools and procedures

Data were collected using a combination of interview and chart review by three BSc midwives who were trained for this purpose. Structured interviewer-administered data collection tools were adopted and modified from different literature. Questionnaires which guided chart review and women interviews were structured into two sections (socio -demographic characteristics and obstetric related factors). Translation of the questionnaire and consent forms from English language into the Afan, Oromo, and Amharic languages was performed. It was also translated back into English to check for consistency of the translation. The questionnaire was pretested and checked for clarity and logical sequence with 5% of the samples before actual data collection began.

Data management and analysis

The collected data were coded and entered into Epi info version 7, then exported to SPSS version 20 for analysis. Data-processing tasks, such as data cleaning, categorizing, and transforming, were then performed to make the data ready for analysis. Descriptive analysis was used to describe the characteristics of the study participants in relation to their different socio-demographic and obstetric variables. Logistic regression analysis was used to identify factors associated with MSAF. First, a simple logistic regression analysis was performed to screen candidate variables that had a crude association with MSAF (p-value <0.25). The selected candidate variables were then subjected to a multiple logistic regression model to estimate their adjusted effects on MSAF. The statistical significance of independent variables on MSAF was declared at P-value <0.05. Finally, the magnitude of association between the independent variables and MSAF was estimated using an odds ratio with a 95% confidence interval.

RESULT

Socio-demographic characteristics

A total of three hundred fourteen women were enrolled in the study with a response rate of 100%. The mean age of the study participants was 24.74 years with a Standard Deviation (SD) of ± 4.23 years. One hundred thirty-two (42%) of the mothers were in the age group of 20 years-24 years and 188 (59.9%) of them were from urban areas. From those respondents, 94.6% of the mothers were married and 53.8% were house wives (Table 1).

Table 1: Socio-demographic characteristics of women who gave birth at term in Adama Hospital Medical College (n=314)

S. No.	Characteristics		Frequency	Percentage (%)
1.	Age in years	≤ 19	36	11.5
		20–24	132	42
		25–29	118	37.6
		30 -34	23	7.3
		≥ 35	5	1.6
2.	Residency	Urban	188	59.9
		Rural	126	40.1
3.	Religion	Orthodox	134	42.7
		Protestant	86	27.4
		Muslim	94	29.9
4.	Educational Status	can't read and write	34	10.8
		Primary school	167	53.2
		Secondary school and above	113	36
5.	Occupation	Housewife	169	53.8
		Merchant	94	29.9
		Employed	37	11.8
		Others	14	4.5
6.	Marital Status	Single	10	3.2
		Married	297	94.6
		Divorced	7	2.2
7.	Total		314	100

Obstetrics related characteristics

The mean gestational age at delivery was 39.25 weeks with SD of ± 1.34 weeks. Nearly half of 155 (49.4%) mothers were Para I and 308 (98.1%) had antenatal care follow-up. The majority (87.9%) mothers had spontaneous onset of labor and 86 (27.4%) had prolonged rupture of membrane. Thirty seven (11.8%) of the mothers had obstetric intervention for nonreassuring fetal heart rate pattern (NRFHP). Regarding the obstetric complications of respondents; 24 (7.6%), 15(4.8%), and 10(3.2%) had Pregnancy-Induced Hypertension (PIH), Oligohydraminos and Antepartum Hemorrhage (APH) respectively (Table 2).

Table 2: Obstetric characteristics of women who gave birth at term in Adama Hospital Medical College (n=314)

S. No.	Obstetric Characteristics		Frequency	Percentage (%)
1.	Parity	Primipara	155	49.4
		Multipara	110	35
		Grand multipara	49	15.6
2.	Gestational age in weeks	37–38+6	262	83.4
		39–40+6	25	8
		41–41+6	27	8.6
3.	ANC follow-up	Yes	308	98.1
		No	6	1.9
4.	APH	Yes	10	3.2
		No	304	96.8
5.	Oligohydraminos	Yes	15	4.8
		No	299	95.2
6.	IUGR	Yes	15	4.8
		No	299	95.2
7.	PIH	Yes	24	7.6
		No	290	92.4
8.	PROM	Yes	19	6.1
		No	295	93.9
9.	Onset of labor	Spontaneous	276	87.9
		Induced	38	12.1
10.	Prolonged labor (≥ 12 hours)	Yes	229	72.9
		No	85	27.1
11.	Prolonged ROM (≥ 8 hours)	Yes	86	27.4
		No	228	72.6
12.	NRFHP	Yes	37	11.8
		No	277	88.2

13.	Status of Liqour	Clear Liqour	239	76.1
		MSAF	75	23.9
14.	Grade of Meconium	Grade-I	9	12
		Grade-II	36	48
		Grade-III	30	40
15.	Stage of labor at the diagnosis of MSAF	Not in labor	3	4
		LFSOL	35	46.7
		AFSOL	26	34.7
		SOL	11	14.7
16.	Mode of delivery	SVD	214	68.2
		C/D	87	27.7
		Instrumental delivery	13	4.1

Prevalence of meconium stained amniotic fluid

The magnitude of meconium stained amniotic fluid was 23.9% (95% CI: 19.1%–29.3%). Out of 75 cases delivered with MSAF, 30 (40.0%) were grade 3 MSAF, 36 (48.0%) were grade 2 MSAF, and 9 (12.0%) were grade 1 MSAF. Among women with MSAF, 35 (46.7%) were in the Latent First Stage of Labor (LFSOL) and 26 (34.7%) were in the Active First Stage of Labor (AFSOL) at the time of diagnosis of MSAF.

Factors associated with meconium stained amniotic fluid

Socio-demographic and obstetric factors associated with MSAF were identified using logistic regression analysis. First, a simple logistic regression analysis was used to identify candidate variables for a multiple logistic regression model. At this level: maternal age, Occupation Status, Gestational age, Onset of labor, Duration of rupture of membrane, Non-Reassuring Fetal Heart Rate Pattern (NRFHP), Antepartum Hemorrhage (APH), oligohydraminos, Pregnancy induced hypertension (PIH), Intrauterine Growth Restriction (IUGR), premature rupture of membrane, and mode of delivery were selected as a candidate variables for P-value < 0.25.

All selected candidate variables were subjected to multiple logistic regression models to estimate their adjusted effect on MSAF after controlling for all possible confounding variables. Accordingly, there were a statistically significant associations between MSAF and Gestational age at the time of delivery, Non-Reassuring Fetal Heart Rate Pattern (NRFHP), Antepartum Hemorrhage (APH), Premature Rupture Of Membrane (PROM), and Oligohydraminos (p-value<0.05).

The study found that; late-term pregnancy (GA 41- 41+6 weeks) had 8.82 times higher odds of having MSAF than early term pregnancy (GA 37 -38+6 weeks) (AOR=8.82; 95% CI: 3.18-24.49). Compared to women with normal amniotic fluid volume, women with oligohydraminos had 5.09 times increased risk of developing MSAF (AOR=5.09; 95% CI: 1.29-20.03). Mothers who had antepartum hemorrhage were 8.43 times more likely to develop MSAF during labor compared to those who didn't have (AOR=8.43; 95% CI: 2.02-35.17). Rupture of the membrane before the onset of labor (PROM) is associated with 10.06 times increased risk of MSAF, compared to women with rupture of the membrane after the onset of labor (AOR=10.06; 95% CI: 1.27-79.98). Women who had Non reassuring fetal heart rate pattern in labor had 4.78 times higher risk of developing MSAF compared to women with normal fetal heart rate pattern (AOR=4.78; 95% CI: 1.64-13.98) (Table-3).

Table 3: Bivariate and multivariable association of meconium stained amniotic fluid and independent factors among women who gave birth at term in Adama Hospital Medical College

S. No	Variable		Status of Amniotic Fluid		COR (95% CI)	AOR (95% CI)
			Clear Liquor: Frequency (%)	MSAF: Frequency (%)		
1	Maternal age in years	≤ 19	27(11.3%)	9 (12.0%)	Ref.	Ref.
		20-24	108 (45.2%)	24 (32.0%)	0.67 [0.28,1.59]	0.49[0.19,1.30]
		25-29	87 (36.4%)	31 (41.3%)	1.07 [0.45,2.52]	0.67[0.25,1.80]
		30-34	16(6.7%)	7 (9.3%)	1.31 [0.41,4.21]	1.07[0.26,4.39]
		≥ 35	1(0.4%)	4 (5.3%)	12 [1.18,121.81]*	7.24[0.56,93.44]
2	Marital status	Single	9 (3.8%)	1 (1.3%)	Ref.	-
		Married	225(94.1%)	72 (96.0%)	2.88 [0.36,23.12]	-
		Divorced	5 (2.1%)	2 (2.7%)	3.60 [0.26,50.33]	-

3	Residence	Urban	146(61.1%)	42 (56.0%)	0.81 [0.48, 1.37]	-
		Rural	93 (38.9%)	33 (44.0%)	Ref.	-
4	Education Status	Can't read and write	24 (10.0%)	10 (13.3%)	Ref.	-
		Primary education	135 (56.5%)	32 (42.7%)	0.57 [0.25, 1.31]	-
		Secondary education and above	80 (33.5%)	33 (44.0%)	0.99 [0.43, 2.30]	-
5	Occupation Status	House wife	131 (54.8%)	38 (50.7%)	Ref.	Ref.
		Merchant	68 (28.5%)	26 (34.7%)	1.32 [0.74,2.35]	0.99[0.49,1.99]
		Employed	32 (13.4%)	5 (6.7%)	0.54[1.96,1.48]*	0.48[0.15,1.55]
		Others	8 (3.3%)	6 (8.0%)	2.59[0.85, 7.91]*	1.69[0.42,6.87]
6	Religion	Orthodox	102 (42.7%)	32 (42.7%)	Ref.	-
		Protestant	62 (25.9%)	24 (32.0%)	1.23 [0.67, 2.29]	-
		Muslim	75 (31.4%)	19 (25.3%)	0.81 [0.43, 1.53]	-
7	Parity	Primipara	116 (48.5%)	39 (52.0%)	0.74 [0.41, 1.34]	-
		Multipara	88 (36.8%)	22(29.3%)	1.19 [0.58, 2.44]	-
		Grand-multipara	35 (14.6%)	14 (18.7%)	Ref.	-
8	Gestational Age	37 – 38+6	214 (89.5%)	48 (64.0%)	Ref.	Ref.
		39 – 40+6	17 (7.1%)	8 (10.7%)	2.10[0.86, 5.14]*	1.29[0.41,4.05]
		41 – 41+6	8 (3.3%)	19 (25.3%)	10.60[4.38, 25.61]*	8.82[3.18, 24.49]**
9	ANC follow-up	Yes	234 (97.8%)	74 (98.7%)	1.58[0.18, 13.75]	-
		No	5 (2.1%)	1 (1.3%)	Ref.	-
10	Antepartum Hemorrhage (APH)	Yes	4 (1.7%)	6 (8.0%)	5.12[1.40, 18.62]*	8.43 [2.02, 35.17]*
		No	235 (98.2%)	69 (92.0%)	Ref.	Ref.
11	Oligohydraminos	Yes	5 (2.1%)	10 (13.3%)	7.20[2.38, 21.81]*	5.09 [1.29, 20.03]*
		No	234 (97.9%)	65 (86.7%)	Ref.	Ref.
12	Pregnancy induced hypertension (PIH)	Yes	12 (5.0%)	12 (16.0%)	3.60[1.54, 8.41]*	2.48[0.81,7.54]
		No	227 (94.7%)	63 (84.0%)	Ref.	Ref.
13	IUGR	Yes	6 (2.5%)	9 (12.0%)	5.29[1.82, 15.42]*	3.04[0.74, 12.50]
		No	233 (97.4%)	66 (89.5%)	Ref.	Ref.
14	PROM	Yes	11 (4.6%)	8 (10.7%)	2.48[0.96, 6.40]*	10.06[1.27, 79.98]**
		No	228(95.4%)	67(89.3%)	Ref.	Ref.

15	Onset of Labor	Spontaneous	213 (89.0%)	63 (84.9%)	Ref.	Ref.
		Induced	26 (10.9%)	12 (16.0%)	1.56[0.75, 3.27]*	0.20[0.03,1.20]
16	Prolonged Labor (≥ 12 hours)	Yes	171 (71.5%)	58 (77.3%)	0.74 [0.40, 1.36]	-
		No	68 (28.5%)	17 (22.7%)	Ref.	
17	Prolonged ROM(≥ 8 hours)	Yes	61 (25.5%)	25 (33.3%)	0.68[0.39, 1.20]*	0.75[0.37,1.49]
		No	178 (74.5%)	50 (66.7%)	Ref	Ref.
18	NRFHP	Yes	20 (8.4%)	17 (22.7%)	3.31[1.58, 6.52]*	4.78[1.64, 13.98]*
		No	219 (91.6%)	58 (77.3%)	Ref.	Ref.
19	Mode of Delivery	SVD	172 (72.0%)	42(56.0%)	Ref	Ref.
		C/D	60 (25.1%)	27 (36.0%)	1.84[1.05, 3.25]*	1.07[0.45,2.56]
		Instrumental Delivery	7 (2.9%)	6 (8.0%)	3.51[1.12, 10.99]*	1.32[0.27,6.53]

Notes: *$p < 0.25$; **$p < 0.05$.

Socio-demographic aspects of cervical cancer patients

In the present study, the mean age at diagnosis was 51.24 years ± 12.63 years, with ranges of 25 years and 81 years. The age range between 40 years and 55 years was predominant (43.56%). Patients were household wives (49.50%), married (82.18%) and mostly illiterate (62.37%).

Patient's background

Medical history included hypertension (23.76%), diabetes (6.93%) and HIV (0.99%). Patients were multigestational (4 or more pregnancies) in 88.11% and multiparous (4 or more deliveries) in 84.16%. Postmenopausal patients accounted for 65.35% of the total. Contraception was used by 8.91%, of whom 0.99% used oral contraception.

Diagnostic aspect

These patients consulted for pelvic pain (39.6%), metrorrhagia (41.58%), pathological leucorrhoea (21.78%), pelvic mass (8.91%), urinary symptoms (4.95%), hydrorrhea (2.97%), and constipation (1.98%).

On speculum examination, the cervix was the site of a budding tumor in 46.67% of cases, ulcero-necrotic in 33.33% and ulcero-budding in 20%.

Histopathology was performed in 63.37% of patients. The histological types found were squamous cell carcinoma (79.69%), adenocarcinoma (15.63%) and sarcoma (1.56%).

Abdomino-pelvic ultrasonography (18.81%) and thoraco-abdomino-pelvic Scan (5.94%) were performed as extension tests. Other examinations included abdominal X-ray without preparation (0.99%), renal ultrasonography (2.97%) and magnetic resonance imaging (0.99%).

At the end of clinical and Para clinical examination, patients were classified according to the stages of the International Federation of Gynecology-Obstetrics. Stage 1 was found in 12.87%.

Stage 2 in 11.88%, stage 3 in 6.93%, stage 4 in 12.87%. In 55.44%, the stage was not specified.

Therapeutic aspect

The majority of the participants received conventional treatment (54.46%). Chemotherapy was based on the cisplatin+paclitaxel protocol.

Survival aspect

As of August 1st 2023, 33 participants (32.67%) were alive; 50 (49.50%) had died, representing a mortality rate of 2.31 per 100,000 inhabitants. The remaining 18 patients (17.82%) were lost to follow-up.

DISCUSSION

The magnitude of meconium stained amniotic fluid was 23.9% (95% CI: 19.1%-29.3%). This finding was comparable with the findings of the study done in Felege Hiwot Referral hospital, northwest Ethiopia (24.6%) [15]. This might be due to the similarity in socio-demography, health institution, and quality of service provided. This finding was also in line with the finding from the Nigerian University Teaching Hospital (20.4%) [16]. This might be due to the similarity in accessibility and quality of services. However, it was higher than the study found in Pakistan (7.7%) [17] and Israel (10.9%) [18]. This discrepancy might be due to the difference between the accessibility and the quality of service in study settings. On the other hand, this finding was lower than the study findings in IPGMER Hospital, India (30.6%) [19]. The difference could be attributed to the time gap between the studies.

In this study, gestational age at the time of delivery was significantly associated with MSAF in labor. Women in late-term pregnancy had 8.8 fold increased risk of MSAF, compared with women in early term pregnancy. The findings of this study were similar to the study done in india which showed a significantly increased risk of MSAF in women whose gestational age is more than 40 weeks [13, 20]. This might be explained by maturation of

the gastrointestinal tract and increased secretion of motilin by the fetus as gestational age advances, which leads to increased fetal bowel peristalsis ending up in the passage of meconium.

Presence of oligohydramnios was another factor associated with the occurrence of MSAF. In this study, those women who had oligohydramnios were 5 times more likely to have meconium stained amniotic fluid than those who did't have. Similar findings were reported from studies done in India and northwest Ethiopia [1, 3, 21]. Fetuses with oligohydramnios usually have low or inadequate uteroplacental reserve, so when women go into labor there will be fetal intolerance to labor which will be manifested by passage of meconium as a result of hypoxia.

Women with PROM had a 10 fold increased risk of developing MSAF, compared with those with no PROM. Similar finding was reported in the study done in SPHMMC, Addis Abeba, Ethiopia14, and the study conducted in Nigeria university teaching hospital [16]. When there is rupture of membrane before the onset of labor (PROM), is an increased risk of intrauterine fetal infection, which in turn causes fetal stress leading to passage of meconium in to the amniotic fluid.

Women with Nonreassuring Fetal Heart Rate Pattern (NRFHRP) were nearly 4.8 times more likely to have meconium stained liquor. This finding was consistent with studies done in Nigeria, India (Kolkata) and United States of America [16,18,19,22]. It was also similar to the the findings of the study done in Felege Hiwot Referral Hospital, northwest Ethiopia. The explanation is often times NRFHRP is a sign of hypoxia and hypoxia stimulates Arginine Vasopressin (AVP) release from the fetal pituitary gland and AVP stimulates colonic smooth muscle to contract, resulting in intra-amniotic defecation.

The limitation of this study was being a cross-sectional study, so it does't establish the temporal sequence between exposure variables and the occurrence of MSAF. We recommend further studies with the other study designs to have a better understanding of the relationship between exposure variables and the occurrence of MSAF.

CONCLUSION AND RECOMMENDATION

The prevalence of MSAF among mothers who gave birth at term was 23.9%. In this study, we have seen that there was a significantly increased risk of MSAF among women with late-term pregnancy, antepartum hemorrhage, oligohydraminos, Premature Rupture of Membrane (PROM), and NRFHP. Due emphasis should be given by the health care providers during intrapartum follow-up of women with late-term pregnancy, oligohydraminos, APH, and PROM for earlier detection of MSAF in labor.

ABBREVIATIONS

AOR - Adjusted Odds Ratio; APH - Ante Partum Hemorrhage; CI - Confidence Interval; COR - Crude Odds Ratio; IUGR - Intra-Uterine Growth Retardation; MAS - Meconium Aspiration Syndrome; MSAF - Meconium Stained Amniotic Fluid; PROM - Premature Rupture of Membrane.

DECLARATIONS
Data Availability

The data for the current study were obtained from the study participants and, on a formal request, it can be obtained from the principal investigator Dr.Dereje Tegene Degife.

Ethical Approval and Informed Consent

Ethical clearance was obtained from the Institutional Ethics Review Board of Adama Hospital Medical College. All concerned officials were notified about the purpose of the study. The informed consent form was approved by the Ethics Review Board of Adama Hospital Medical College. Informed consent was obtained verbally from each study participant before data were collected. The data's confidentiality was assured by using the code as identification; the mothers' names were not recorded.

Consent for Publication
Not applicable.

Author's Contribution

The corresponding author developed the concept of the study. All authors took part in drafting, execution, acquisition, and interpretation of data. For the preparation proposal all authors were involved in the development of the methodology, in the literature review and critically reviewing the article. Training of the data collectors, supervision at the time of data collection, data entry, data analysis, report writing, and development of the manuscript were undertaken with the involvement of all authors. In addition, all authors read and gave final approval of the submitted document and have agreed to be published by the journal. The authors agreed to take responsibility and be accountable for the contents of the article.

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The authors declare no conflicts of interest in this work.

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