

# Fetal Outcome and Mode of Delivery in a Patient with Meconium-Stained Amniotic Fluid

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## Abstract

**Background:** Meconium stained amniotic fluid (MSAF), especially observed before term, is considered a sign of fetal jeopardy. Although many studies characterized this condition and associated it with delivery mode, data is lacking in this area, Saudi Arabia. Thus, we attempted to study it. **Methods:** All data were retrieved from pregnant patients with MSAF who delivered at King Abdul, Saudi Arabia, from January 2015 to December 2018. **Results:** 758 showed MSAF, of which 83% had vaginal delivery, whereas remaining 17% had an emergency caesarean section. Of them, 32 (4.2%) infants developed meconium aspiration syndrome, and 7 (21.8%) were admitted to the NICU. **Conclusion:** It was reconfirmed that MSAF is associated with a newborn risk, especially meconium aspiration syndrome. Patients had a higher rate for emergent caesarean section and baby admission to NICU. These data may be useful to make health/reproductive-health policy-making in this area.

## Keywords

Meconium, Fetal Outcome, Mode of Delivery

## 1. Introduction

Meconium is the name given to elements which have collected in the fetal gut in the time of intrauterine life. The parts of Meconium incorporate water (72% - 80%), desquamated cells from the digestive system and skin, gastro-intestinal bodily fluid, lanugo hair, material from vernix caseosa, amniotic liquid, intestinal emissions, blood bunch explicit glycoprotein's, and bile and medication metabolite [1].

Amniotic fluid Meconium staining is classified as grade 1, 2, and 3. Visual in-

spection of Grade 1 MSL is translucent, light yellow-green in colour. Grade 2 MSL is opalescent with deep green, and Grade 3 is opaque and deep green [2]. Incidence of Meconium-stained amniotic fluid ranges from 7% - 22%, while Meconium aspiration syndrome (MAS) happens in just about fifth of all cases of MSAF [3].

Risk factors, for example, advanced gestational age at delivery, delivery mode, extended second labour phase, and intrauterine infection [4], placental deficiency, maternal hypertension, pre-eclampsia, oligohydramnios or maternal medication misuse (tobacco or cocaine) likewise lead to, the in-utero passage of faecal matter [5]. Although MSAF's exact aetiology remains uncertain [4], meconium-stained amniotic fluid (MSAF) is an acute associate sign of fetal compromise and related to a poor perinatal outcome [6]. Moreover, it has been correlated with an enhanced danger of developing chorioamnionitis and is associated with negative fetal results, including neonatal sepsis, cerebral palsy, seizures, and Meconium aspiration syndrome (MAS) as the most severe result [7].

The entry of Meconium isn't familiar before 34 weeks of incubation. Past that period, the occurrence bit by bit increases [8]. Vagal stimulation from epithelial duct compression induces fetal hypoxic stress, leading to expanded peristalsis and relaxation of anatomical sphincter resulting in the intrauterine passage of faecal matter [9]. Meconium stained neonates are at risk for developing metabolic process distress than neonates born with clear fluid. MSAF predisposes perinatal mortality even in patients with terribly low risk for medical speciality complications [8].

A prospective observational study was done at Silchar Medical College and Hospital from June 2015 to June 2016. All the pregnant women more than 37 weeks of gestation, with singleton pregnancies, getting admitted in the labour room with Meconium stain liquor were included in the study, Out of 240 patients of Meconium stain liquor, 122 patients had a standard vaginal delivery, 15 patients had instrumental conveyance, and 103 patients were taken up for emergency lower section delivery. Out of 240 newborns, two died in the intensive care unit. One hundred three babies were admitted to the intensive care unit. One hundred thirty-five babies were healthy and were handed over to the mother [10].

There is an apparent lack of studies regarding MSAF, in this study, we aim to observe fetal outcome and Mode of delivery in the patient with Meconium-stained amniotic fluid.

## 2. Material and Method

A retrospective study.

We collected the data for all female patient who has meconium stain amniotic fluid from the hospital medical records of labour and delivery unit started from 1st of January 2015 to December 2018 while we excluded the patient that doesn't have meconium-stained amniotic fluid. The number of deliveries was 15,483 women, and the number of patients included in the study was 758.

The following data were extracted from the mother: age, gravida, gestational age, weight, blood group, nationality, type of delivery, perineum, analgesia. While the following data were extracted from the baby: birth weight, APGAR score, resuscitation.

Data entry was performed by using Microsoft excel 2019, and SPSS V21 performed the statistical analysis. This study has been approved by the institutional review board (IRB) of KAUH. And the methods carried out in “accordance” with the approved guidelines.

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### 3. Result

A retrospective study was conducted from January of 2015 until December of 2018. Seven hundred fifty-eight cases of MSAF out of 15,483 women was included in this study. The percentage of MSAF was 4.9%. We aim to observe fetal outcome and Mode of delivery in the patient with meconium-stained amniotic fluid at Saudi Arabia at King Abdulaziz university hospital. And the subsequent results were noticed.

As shown in **Table 1**, the mean ages of the patient presented with MSAF are 28.7 ( $\pm 5.83$ , ranges 15 - 46) while the mean number of pregnancies and number of times that she has conceived consequence is 2.9 ( $\pm 2.15$ , ranges 1 - 13), 1.6 ( $\pm 1.83$ , ranges 0 - 10). The mean birth weight of MSAF is 3.16 kg ( $\pm 0.47$ , ranges 1.50 - 4.60). As seen in **Table 2**, in a pregnant patient with MSAF increase or decrease in the maternal age does not have any significant relationship with the probability of the neonate to develop MAS. At the same time, there is a substantial chance that MAS will complicate the pregnancy with the number of pregnancies and number of times that she has conceived.

As seen in **Table 3**, out of 758 cases of patients with MSAF, 32 (4.2%) of neonate devolved MAS, while 725 (95.8%) of neonate didn't devolve MAS. The patient who has premature labour is at risk to have MSAF it may or may not complicated with MAS. We found out that 1:3 patient with MSAF that complicated by MAS was in premature labour, the majority of a patient who devolved MAS did not have early work. There is a significant relationship between the Mode of delivery and patient with MSAF (**Table 4**).

We found that normal delivery was two times the caesarean section 2:1 ratio in patient complicated by MAS. Neonates with MAS have a high risk for NICU admission compared with neonates who do not have MAS. A significant relationship with the sex of the baby and patient with MSAF, we found that incidence of having a baby girl two times the incidence of having a baby boy 2:1 ratio in patient complicated by MAS. In pregnancy with MSAF, the majority of maternal blood group is O+, although the majority of anaesthesia that used was pethidine. In complicated cases of MAS, most of the patient has intact perineum

**Table 1.** Maternal and neonatal demographic characteristics with MSAF (n = 758).

	Minimum	Maximum	Mean	Std. Deviation
Age	15	46	28.7	5.83
Gravida	1	13	2.9	2.15
Parity	0	10	1.6	1.83
Abortion	0	6	0.4	0.79
GA	28	43	39.7	1.55
Weight	37.5	214	72.6	15.10
Birth wt.	1.50	4.60	3.16	0.47
Apgar 1	0	10	8.4	1.5
Apgar 5	0	10	9.7	1.1

**Table 2.** Maternal and neonatal demographic characteristics with MSAF complicated by MAS.

	Meconium Positive 32	Meconium Negative 725	P
Age	29.0 ± 5.6	28.7 ± 5.8	0.791
Gravida	4.1 ± 2.9	2.9 ± 2.1	0.001
Parity	2.5 ± 2.3	1.5 ± 1.8	0.004
Abortion	0.6 ± 1.2	0.3 ± 0.8	0.051
Gestational age	39.7 ± 1.5	39.7 ± 1.6	0.966
Weight	7.23 ± 2.2	72.7 ± 1.5	0.814
Birth weight	3.2 ± 0.52	3.2 ± 0.46	0.572
Apgar 1	7.9 ± 1.9	8.4 ± 1.1	0.083
Apgar 2	9.5 ± 0.8	9.7 ± 1.1	0.383

**Table 3.** Maternal and neonatal demographic characteristics with MSAF and divided by the probability of developing MAS.

	Meconium positive 32 (4.2%)	Meconium negative 725 (95.8%)	Odd Ratio 95% CL	P
Primigravida				
✓ Yes	7	224	1.597 (0.681 - 3.746)	0.198
✓ No	25	501		
Premature labour				
✓ Yes	2	163	0.477 (0.165 - 1.380)	0.017
✓ No	30	562		
Nationality				
✓ Saudi	28	558	0.725 (0.224 - 2.341)	0.115
✓ Non-Saudi	4	167		
Spontaneous labour				
✓ Yes	21	526	1.095 (0.477 - 2.515)	0.488
✓ No	8	183		

## Continued

Mode of delivery				
✓ SVD	22	605	2.350 (1.085 - 5.093)	0.030
✓ C/S	10	127		
NICU admission				
✓ Yes	7	17	0.086 (0.033 - 0.225)	0.001
✓ No	25	708		
Sex				
✓ Girl	22	332	0.384 (0.179 - 0.822)	0.009
✓ Boy	10	393		

**Table 4.** Maternal and neonatal demographic characteristics with MSAF and divided by the probability of developing MAS.

Factor	Meconium positive 32 (4.2%)	Meconium negative 725 (95.8%)	P
Blood Group			
✓ AB+	1	23	0.846
✓ AB-	0	2	
✓ A+	12	196	
✓ A-	0	14	
✓ B+	3	84	
✓ B-	0	6	
✓ O+	13	308	
✓ O-	2	19	
Total = 683	31	625	
Analgesia or anaesthesia			
✓ spinal	6	49	0.147
✓ epidural	2	60	
✓ GA	2	27	
✓ pethidine	12	333	
✓ Entonox	6	132	
Total = 629	28	601	
Perineum			
✓ 1st-degree tear	9	219	0.211
✓ 2nd-degree tear	4	70	
✓ 3rd-degree tear	0	5	
✓ episiotomy	5	234	
✓ intact	13	187	
Total = 746	31	715	

during the time we found out that uncomplicated cases of MAS the Physician had to do an episiotomy.

#### 4. Discussion

Meconium passage might be a natural physiological event that is reflecting fetal development. One of the essential concerns we fear for any patient with MSAF that the baby may aspirate the Meconium substance and cause problems in the lung. Hence we aimed to observe fetal outcome and Mode of delivery in the patient with Meconium-stained amniotic fluid.

Data from our study revealed a total number of 758 had MSAF from which 32 (4.2) of neonate developed MAS, compared to a case-control study of Meconium-stained amniotic fluid, was carried out in Dhiraj General Hospital, Pipariya a total number of 150 had MSAF from which 27 (18%) of neonate developed MAS. Important data from our study showed that there are significant concerning the number of pregnancies (P-value = 0.004) and a number of times (P-value = 0.001). In comparison to other studies which showed no significant association was found with parity such as a retrospective study was conducted at the Agha Khan Hospital showed a P-value = 0.36 [11] and a Cross-sectional study carried in-hospital birth centre in the city of São Paulo, South-eastern Brazil showed P-value = 0.6800 [12]. Normal delivery was two times the caesarean section in a patient with MSAF, As to a study done by, Gupta SN *et al.* reported that 22% of MSAF group had normal vaginal delivery while, caesarean section delivery was 66% among MSAF group Caesarean section was seen more in MSAF group; also Rajlaxmi Mundhra and Manika Agarwal found Caesarean section rates were nearly double in cases (49.09%) of MSAF Moreover in a study done by J Pak Med Assoc showed that Among 250 women with MSAF 205 women delivered by caesarean section and 35 women had vaginal deliveries, in comparison. Moreover, the patients who had Meconium staining of amniotic fluid 24 babies were admitted in NICU, Nath P. found that out of which 240 patients had Meconium staining of amniotic fluid. Hundred three (103) 42.9% of babies were admitted in NICU. The patient who had premature delivery and have MSAF most of their neonate didn't complicate with MAS, compare to our research had a smellier result. A further suggestion we should consider comparing the Cardiotocography (CTG) of Meconium-stained amniotic liquor and clear liquor.

So our prevalence of MSAF and neonates to developed MAS were higher than in other studies, one of the risk factors is multiple parties. Meconium stained amniotic fluid is not an indication for caesarean section. It's not necessary to develop an unfortunate neonatal outcome. A practical, secure, efficient, and based on risk assessment strategies are needed to avoid MAS; nonetheless, MSAF needs strict management during work for the better perinatal result.

There were no new findings in this study but the present study reconfirmed the pre-existing data, which may be of some use to make health-policy-making in this area.

## 5. Conclusion

In conclusion, MSAF keeps on being a frequent concern for MAS, MSAF is extremely bothersome from both obstetrician's and paediatrician's perspective, to decrease perinatal morbidity and mortality an extensive fetal monitoring is mandatory in MSAF.

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## Authors' Contributions

- AT = Principal Investigator, Planning, and drafting the manuscript.
- RA = Study idea, literature review, data collection.
- DA = Data collection, drafting the manuscript.
- DA = data entry, supervise the data collection.
- RA = statistical analysis and drafting.
- AJ = Data interpretation final approval the manuscript.

## All Data and Materials Are Available

The study was approved by the ethics committee of KAUH.

A retrospective study was done at King Abdulaziz University Hospital, which is a governmental teaching hospital where it provides free medical care, department of obstetrics and gynaecology in the western region of Saudi Arabia, city of Jeddah 2020.

This study has been approved by the institutional review board (IRB) of KAUH. And the methods carried out in "accordance" with the approved guidelines.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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