Effect of Meconium Stained Liquor on Mode of Delivery and Fetomaternal Outcome at Term

ASMA QAYYUM1, RUBINA IQBAL2, HUMA MAZHER3
1Senior Registrar, Obstetrics & Gynaecology, Fatima Memomorial Hospital, Lahore
2Professor, Obstetrics & Gynaecology, Fatima Memorial Hospital, Lahore
3Post Graduate Resident, Obstetrics & Gynaecology, Fatima Memorial Hospital, Lahore
Correspondence to: Rubina Iqbal, Email: rubinat021@gmail.com, Cell: 03009453560

ABSTRACT
Background: Meconium-stained amniotic fluid is a major reason for concern for both obstetricians and pediatricians since it raises the risk of birth hypoxia, maternal-asphyxia syndrome, and hospitalizations to the neonatal intensive care unit.
Objective: To find the frequency of meconium stained liquor in females presenting in labor at term and to compare the frequency of adverse feto-maternal outcome with or without meconium stained liquor in females presenting in labor at term.
Materials & Methods
Study Design: Descriptive study
SETTING: Department of Obstetrics & Gynecology, Fatima Memorial Hospital Lahore
Duration: Six months i.e. 15-12-2020 to 15-6-2021
Data Collection Procedure: A total of 175 females fulfilled the inclusion criteria were included. Then females were followed up in labor room. If meconium stained liquor was observed, then it was noted and female were divided in two groups i.e. with meconium stained liquor and without meconium stained liquor. Mode of delivery was noted. Apgar score was noted and labeled as poor if <7 at 5 minutes. Birth asphyxia and need for NICU admission was noted. Than all these patients were followed up in gynecology wards for 3 days, neonatal mortality was noted, if occurred.
Results: In this study frequency of meconium stained liquor in females presenting in labor at term was 51.9%. Comparison of feto-maternal outcome in women with and without meconium stained liquor showed that C-section rate (37.3% vs. 18.5%, p-value=0.008), Poor Apgar score (7.8% vs. 1.6%, p-value=0.40), NICU admission (13.7% vs. 3.2%, p-value=0.009), Birth Asphyxia (19.6% vs. 4%, p-value=0.001) and early neonatal mortality (13.7% vs. 3.2%, p-value=0.009) was significantly higher among women with meconium stained liquor.
Conclusion: Keeping in mind the results of this study it can be concluded that positive meconium stained liquor had a significantly impact on maternal as well as neonatal outcome.
Keywords: Meconium, Stained liquor, C-section, Birth Asphyxia, NICU, Mortality

INTRODUCTION
The presence of meconium-stained amniotic fluid during spontaneous labor at term is prevalent among women and has been linked to negative consequences for both the mother and the newborn. Women in preterm labor with intact membranes who have amniotic fluid that is stained with meconium are at increased risk for microbial invasion of the amniotic cavity and premature delivery. Meconium is often passed by full term newborn. The first bowel movement of a baby is meconium, the meconium, including green, brown, and yellow. Meconium is often passed by full-term, healthy newborns during the first 48 hours of life. Delayed transit is a common symptom of prematurity. 6. 7 Fetal and neonatal effects, in addition to maternal concerns, are associated with intrauterine meconium emission.

In a study, Patients with meconium-stained amniotic fluid had a cesarean delivery at a rate of 99/149 (66.4%). Furthermore, low birth weight was identified in 9/149 infants, NICU hospitalization was seen in 25/149 patients, and 14/149 babies had low APGAR scores. 10. Rationale of this study is that to determine the frequency of adverse feto-maternal outcome with meconium stained liquor is important as literature has showed that the complications of meconium stained liquor are high. But varied data has been observed in literature. Moreover, there is very few work done in this regard as well as few local studies found, but they have varied results, which makes it important to conduct this study in local population. After finishing this research, we'll have proof for locals and can put the findings into practice.

Objectives
1. To find the frequency of meconium stained liquor in females presenting in labor at term.
2. To compare the frequency of adverse feto-maternal outcome with or without meconium stained liquor in females presenting in labor at term.

MATERIAL & METHODS
Study Design: Descriptive Cross sectional study
Venue: Department of Obstetrics & Gynecology, Fatima Memorial Hospital Lahore
Study Period: 6 months i.e. from 15-12-2020 to 15-6-2021
Sample Size: Sample size of 175 females is calculated with 95% confidence level, 7% margin of error and taking expected prevalence of meconium stained liquor i.e. 33.33% in female presenting in active labor at term.
Sampling Technique: Non-probability, consecutive sampling
Selection Criteria: Females of age 18-40 years, with any parity <5 presenting at gestational age >37 weeks in active labor (>3 contractions in 15 minutes, Bishop score >4, cervical dilation >4cm) were enrolled. Females with multiple pregnancy, non-cephalic presentation, still birth, congenital fetal abnormalities, ruptured membrane, renal disease or pulmonary disease, pregnancy induced hypertension, eclampsia, gestational diabetes mellitus, previous caesarean section were excluded.
Data Collection Procedure: After approval from hospital ethical committee 175 females fulfilling the inclusion criteria were included through labor room. Informed consent was obtained. Demographic data including name, age, parity, gravidity, gestational age and BMI was recorded. Then females were followed up in labor room. If
Meconium stained liquor was observed, then it was noted and labeled as poor if y of meconium stained amniotic liquor was noted and labeled as poor if <7 at 5 minutes. Birth asphyxia and need for NICU admission was noted. NICU admission was done if neonate required admission in NICU for more than 6 hours due to poor Apgar score, birth asphyxia (oxygen saturation <90%, wheezing, chest in drawing, poor sucking). Than all these patients were followed up in gynecology wards for 3 days. If neonate died within 3 days, neonatal mortality was labeled. All this data was recorded in a specially designed proforma. All patients and neonates were efficiently managed according to standard protocols.

**Data Analysis:** The data was entered and analyzed through SPSS version 20. Adverse outcome was compared in groups with or without meconium stained liquor by applying chi square test. p-value<0.05 was taken as significant.

**RESULTS**

Mean age of women was 29.6±3.6. Among women 31(17.7%) women were primary parous and the remaining 144(82.2%) were multiparous. Among women 9(5.1%) had normal BMI, 65(37.1%) were overweight and 101(57.7%) were obese. Mean duration of gestation was 37.76±0.90. Meconium stained liquor was present in 51(29.1%) women. Among women 42(24%) underwent C-section, 65(37.1%) had early mortality. Table 1 C-section rate (37.3% vs. 18.5%, p-value=0.009), Poor Apgar score (7.8% vs. 1.6%, p-value=0.040), NICU admission (13.7% vs. 3.2%, p-value=0.009), Birth Asphyxia (19.6% vs. 4%, p-value=0.001) and early neonatal mortality (13.7% vs. 3.2%, p-value=0.009) was significantly higher among women with meconium stained liquor present. Table 2

<table>
<thead>
<tr>
<th>Parity of Women</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>31</td>
<td>17.7%</td>
</tr>
<tr>
<td>2</td>
<td>54</td>
<td>30.3%</td>
</tr>
<tr>
<td>3</td>
<td>48</td>
<td>27.4%</td>
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<tr>
<td>4</td>
<td>42</td>
<td>24%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Body Mass Index</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>99</td>
<td>57.7%</td>
</tr>
<tr>
<td>Overweight</td>
<td>65</td>
<td>37.1%</td>
</tr>
<tr>
<td>Obese</td>
<td>101</td>
<td>57.7%</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Meconium-stained amniotic fluid is a major reason for concern for both obstetricians and pediatricians since it raises the risk of birth hypoxia, maternal-asphyxia syndrome, and hospitalizations to the neonatal intensive care unit. In this study frequency of meconium stained liquor in females presenting in labor at term was 51(29.1%). Comparison of feto-maternal outcome in women with and without meconium stained liquor showed that C-section rate (37.3% vs. 18.5%, p-value=0.009), Poor Apgar score (7.8% vs. 1.6%, p-value=0.040), NICU admission (13.7% vs. 3.2%, p-value=0.009), Birth Asphyxia (19.6% vs. 4%, p-value=0.001) and early neonatal mortality (13.7% vs. 3.2%, p-value=0.009) was significantly higher among women with meconium stained liquor.

Dagne Addis in his study reported the prevalence of meconium stained amniotic fluid as 17.8%. Nadia Mohammad in her study reported the frequency of meconium stained liquor in females presenting in labor at term was 51(29.1%). Comparison of feto-maternal outcome in women with and without meconium stained liquor showed that C-section rate (37.3% vs. 18.5%, p-value=0.009), Poor Apgar score (7.8% vs. 1.6%, p-value=0.040), NICU admission (13.7% vs. 3.2%, p-value=0.009), Birth Asphyxia (19.6% vs. 4%, p-value=0.001) and early neonatal mortality (13.7% vs. 3.2%, p-value=0.009) was significantly higher among women with meconium stained liquor.

Fig 1: Distribution of meconium stained liquor
morality in newborns.\textsuperscript{16} Consistent with these findings, another research found that the risk of delivery asphyxia was considerably greater among newborns with a positive meconium stain liquor (15.15\% vs. 5.26\%, p = 0.002). Meconium in the amniotic fluid has been recognized as a major risk factor for birth hypoxia, according to a recent research from Pakistan. Thus, meconium staining was seen in 80.3\% of newborns with birth asphyxia.\textsuperscript{17}

MSAF is more prevalent in babies born late in the pregnancy. Its occurrence is age-dependent. Preterm infants (5.1\%), full-term infants (16.5\%), and postterm infants (27.1\%) were found to have MASF in a single research. Only 2-10\% of infants born with meconium-stained amniotic fluid (MASF) really go on to develop MAS. Increased post-term birth rates are associated with lower rates of access to care, which in turn increases the prevalence of MAS. Despite other difficulties, it was also lower in regions with a high prevalence of early cesarean procedures. According to one research, the prevalence of MASF is greater in Black patients.\textsuperscript{18-20}

Cardiotocography was found to be reassuring in 71.2\% of MSAF patients and non-reassuring in 28.8\%; the latter was most strongly associated with thick meconium (p-value < 0.001), whereas Desai et al. found no such association. The higher rate of cesarean section for women with thick meconium (60\% vs 71\%, p-value 0.003) suggests that obstetricians are more forceful when managing labor in women with MASF. Consistent with these results, Kumar S et al. found that thin meconium was associated with a greater rate of cesarean birth (72\%) compared to thick meconium (21\%). The development of thick meconium later in the second stage might be to blame.\textsuperscript{21}

Desai’s research also found that compared to the control group, infants with thick meconium were more likely to be admitted to a nursery. There was no statistically significant difference between the groups since most infants in both groups were born healthy and asymptomatic. When the meconium was very thick, endo-tracheal suction was required (p = 0.04). Thick meconium was associated with a higher prevalence of MAS than thin meconium was (p=0.02), and MAS was discovered in 0.94 percent of all births and 12 percent of MASF cases. The frequency of MAS in babies born with MASF varies between 1.6\% and 6.8\%. Prevention actions should be practical, secure, effective, and based on risk assessment since MAS increases the likelihood of a child needing treatment at a neonatal critical care unit and causes long-term morbidity and mortality.\textsuperscript{22}

Babies delivered to moms who did not have prenatal appointments were more likely to have MAS (p-value<0.001). None of the moms in the current research experienced pre-eclampsia, although anemia in pregnancy, gestational diabetes, pregnancy-induced hypertension, and early rupture of membranes were all significant risk factors for MAS. Pregnancy-related anemia and pregnancy-induced hypertension were both linked to an increased risk of MAS (p-value < 0.03 and <0.001, respectively). Maternal anemia and pregnancy-induced hypertension were both identified by Ashtekar in India as prenatal risk factors for MAS.\textsuperscript{21,23}

In light of what has been discussed, it is safe to say that obstetricians and pediatricians should be quite concerned when they see meconium in the amniotic fluid. Therefore, in order to reduce meconium-related problems and enhance fetal success, the presence of thick meconium calls for vigilant monitoring, early and prompt obstetrical intervention, and proper post-natal care.

\textbf{CONCLUSION}

Keeping in mind the results of this study it can be concluded that positive meconium stained liquor had a significantly impact on maternal as well as neonatal outcome. It not only increases the cesarean section rate as well as it had significant morbidity towards neonatal outcome.

\textbf{REFERENCES}


