

## Original Article

# Meconium Stained Liquor Amnii, Neonatal Mortality and Their Management Among High Risk Pregnancy

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**ABSTRACT**

**Introduction:** High-risk pregnancy cases can cause severe mental and physical burden on the mothers, along with their partners. Various factors can increase or decrease the risks faced by high-risk pregnancy cases, among which, amniotic fluid, or liquor amnii is an important factor. The present study was conducted to explore and compare perinatal mortality and management in high-risk pregnancies with meconium stained liquor and perinatal mortality and management in high-risk pregnancies meconium stained liquor. **Aim of the study:** The aim of the study was to observe neonatal mortality and management of high-risk pregnancy cases with and without meconium. **Methods:** This cross-sectional comparative study was conducted at the Department of obstetrics and gynecology, Combined Military Hospital (CMH), Cantonment, Dhaka, Bangladesh. The study duration was 6 months, from February 2012 to July 2012. The study was conducted with a total of 86

women among those who were admitted at the high-risk antenatal ward of the study hospital. **Result:** Total 86 high risk cases were taken for the study. Among them 12 (14.0%) were found with meconium stained liquor (group-A) and 74 (86.0%) cases were found without meconium stained liquor (group-B). In group A common risk factors were prolonged pregnancy (33.3%), then hypertensive disorder 25.0%. In group B common risk factors were hypertensive disorder in 23.0% then diabetes in 18.9%. Regular antenatal care was observed for majority of the cases in both groups. Cord around the neck was observed 25.0% cases in group A in comparison to 8.1% in group B. In group A, 8.3% of cases were associated with short cord, 8.3% with long cord. In group B 4.1 % cases was found with long cord. The difference in cord size was statistically significant. **Conclusion:** The study observed that participants with meconium stained liquor amnii were at higher risk in all factors. Severe high risk pregnancy cases had higher frequency among those with liquor amnii. Comparing the various factors of maternal and neonatal health among the participants, it was observed that umbilical cord size and neonatal management were the only significant factors among participants with and without meconium stained liquor.

**Keywords:** Meconium, Pregnancy, Liquor, Amniotic Fluid

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## INTRODUCTION

Pregnancy is a physiologically unique period in a woman's life. However, the pregnancy might be affected by the mother's pre-existing ailment or an unforeseen sickness. Pregnancy is a significant time in a woman's life because she undergoes many physical, emotional, and social changes. They have major challenges as a result of ineffective dealing with such changes.<sup>[1]</sup> A pregnancy is considered when it threatens the health or life of the woman, her fetus, or both, despite the fact that all pregnancies carry some risk or difficulties.<sup>[2],[3]</sup> High-risk pregnancy can be caused by a variety of reasons or triggers, both emotional and physical, and can put women in danger.<sup>[4]</sup> Although it is not very prevalent, high-risk pregnancies account for 22 percent of all pregnancies.<sup>[1]</sup> It's linked to a variety of medical issues, which can lead to mood swings, as well as mental and social issues. According to studies, women who are pregnant at high risk suffer negative emotions as restlessness, dread, loss of control, disability, wrath, and worry.<sup>[5]-[7]</sup> Women with HRP also have behavioral, affective, and emotional disorders, as well as issues with personal and familial role performance, according to a qualitative research. Furthermore, individuals are vulnerable to sociocultural and socioeconomic stress, as well as uncontrolled emotions like uncertainty, anxiety, and insecurity.<sup>[6]</sup> High-risk pregnancy may be caused by one or more factors that were present before or developed during an otherwise normal pregnancy. High-risk pregnancy is a subset of the obstetric population that accounts for the bulk of mother and newborn mortality. In order to optimize their success, it necessitates advanced maternal and fetal observation, as well as, on occasion, challenging treatment decisions. Maternal mortality is still on the higher side in developing countries like India and Bangladesh despite so much advancements in obstetrical critical care over the last few

years.<sup>[8]</sup> A major reason behind such poor maternal and perinatal outcomes is the severe shortage of intensive care facilities as compared to the number of critically sick population. Among the various indications of high risk pregnancy, the presence of meconium-stained amniotic fluid (MSAF) during labor has been long considered the predictor of adverse fetal outcomes such as meconium aspiration syndrome and perinatal asphyxia, which leads to perinatal and neonatal morbidity and mortality.<sup>[9],[10]</sup> Meconium is a germ-free, thick, black-green, odorless material which is first recognized in the fetal intestine around 12 weeks of gestation and stores in the fetal colon throughout gestation.<sup>[11]-[13]</sup> Although it is a major indicator of adverse outcomes, it is not the sole indicator. The present study was conducted to observe the perinatal outcome high risk pregnancies both with the meconium stained liquor amnii and without the meconium stained liquor amnii.

## OBJECTIVE

### General Objective

- To compare the neonatal mortality in high-risk pregnancies with and without meconium stained liquor amnii

### Specific Objectives

- To compare the neonatal management in high-risk pregnancies with and without meconium stained liquor amnii

## METHODS

This cross-sectional comparative study was conducted at the Department of obstetrics and gynecology, Combined Military Hospital (CMH), Cantonment, Dhaka, Bangladesh. The study duration was 6 months, from February 2012 to July 2012. The study was conducted with a total of 86 women among those who were admitted at the high-risk antenatal ward of the study hospital. High risk pregnancies were categorized as pregnant women who had

their pregnancy complicated by hypertension, gestational diabetes, anemia, pre-eclampsia, APH, multiple pregnancies and age of 18 years or less at time of pregnancy. Severity of the risk was analyzed by following the Coopland Scoring System, 1977.<sup>[14]</sup> The total participants were divided into two groups based on the presence of meconium stained liquor amni. Group-A consisted of 12 patients with meconium stained liquor, while group-B consisted of 74 patients without meconium stained liquor amni. After discussing with the patient regarding the study goals and getting consent from them, a detailed history was taken regarding obstetrical, menstrual, medical, and surgical factors. Detailed history was taken regarding any known medical disorder, abortion, caesarean section, age of the patient, any stillbirth, IUD. Ethical approval was obtained from the ethical review committee of the study hospital. After collection, data were checked for inadequacy, irrelevancy and inconsistency. Irrelevant and inconsistent data were discarded. All data were processed and analyzed by using computer based statistical software.

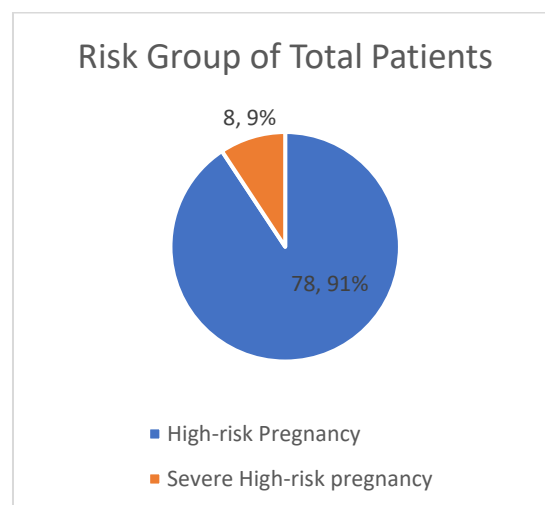
#### Inclusion Criteria

- High-risk pregnancies without meconium stained liquor
- High-risk pregnancies with meconium stained liquor
- Patients who had given consent to participate in the study.

#### Exclusion Criteria

- Mentally ill.
- Unable to answer the criteria question.
- Congenital anomaly of baby (diagnosed antenatal by USG)
- Exclude those affected with other chronic diseases etc.

## RESULTS



**Figure 1:** Risk group distribution of the total participants (n=86)

Coopland et al.'s risk scoring system was used to determine the risk score of the participants. According to the scoring, about 90.7% of the participants had high risk pregnancy, while the remaining 9.3% had severe high risk pregnancy

**Table 1:** Risk group distribution of the participants with or without meconium stained liquor (n=86)

Risk groups	Group-A (n=12)	Group-B (n=74)	p value
High risk pregnancy	9 (75%)	69 (93.24%)	0.079
Severe high-risk pregnancy	3 (25%)	5 (6.76%)	

Among the participants of both group, severe high risk pregnancy had low incidence rate, with 25% in group-A and 6.76% in group-B. But meconium stained group had a higher frequency of severe high risk pregnancy compared to the group without meconium stained liquor amni.

However, this difference was not statistically significant.

**Table 2:** Risk factor distribution among the participants with or without meconium stained liquor (n=86)

Risk factors	Group-A (n=12)	Group-B (n=74)	p value
Hypertensive disorders	3 (25.0)	17 (23.0)	0.999
Diabetes	2 (16.7)	14 (18.9)	0.999
Prolonged pregnancy	4 (33.3)	12 (16.2)	0.224
Previous caesarean section	1 (8.3)	10 (13.5)	0.999
PROM	2(16.7)	6(8.1)	0.309
Malpresentation	0(0)	6(8.1)	0.306
Other medical disorders	0(0)	9 (12.16)	0.348

Among group-A participants, prolonged pregnancy was the most common (33.3%) risk factor, followed by hypertensive disorders observed in 25%, diabetes and PROM in 16.7% each and previous caesarean section in 8.3% of the participants. In group-B, hypertensive disorder had the

highest prevalence (23%) as a risk factor, followed by diabetes in 18.9%, prolonged pregnancy in 16.2%, previous cesarean section in 13.5%, PROM in 8.1%, Malpresentation in another 8.1%, and other medical disorders in 12.16%. The difference of risk factors between the two groups was not statistically significant.

**Table 3:** Antenatal care type distribution among the participants with or without meconium stained liquor (n=86)

Antenatal Care	Group-A (n=12)	Group-B (n=74)	p-value
Regular	10 (83.3)	62 (83.8)	0.999
Irregular	2 (16.7)	12 (16.2)	
Total	12 (100.0)	74 (100.0)	

Among the group-A participants, 83.8% had regular antenatal care and 16.7% did not, while in group-B, 83.8% had regular antenatal care while 16.2% had irregular antenatal care. This difference was statistically insignificant.

**Table 4:** Distribution of the participants according to duration of gestation period (n=86)

Duration of gestation (In weeks)	Group-A (n=12)	Group-B (n=74)	p-value
28 - 34	1 (8.3)	3 (4.1)	0.911
>34 - 37	1 (8.3)	5 (6.8)	
37- 40	6 (50.0)	37 (50.0)	
>40	4 (33.3)	29 (39.2)	

Among group-A participants, gestational age was between 37-40 weeks in 6 (50.0%), >40 weeks in 4 (33.3%), between 28-34 weeks in 1 (8.3%) and between >34 - 37 weeks in the remaining 1 (8.3%) patient. In group-B, gestational age was between 37-40 weeks in 37 (50.0%), > 40 weeks in 29 (39.2%), between >34 - 37 weeks in 5 (6.8%), and between 28 - 34 weeks. in 3 (4.1%). The difference of gestational duration between the participants of both groups were not statistically significant.

**Table 5:** Distribution of the neonates by neonatal characteristics in both groups (n=86)

Variables	Group-A (n=12)	Group-B (n=74)	p value*
<b>Umbilical Cord Size</b>			
<b>Normal</b>	10 (83.3)	71 (95.9)	<b>0.034</b>
<b>Short</b>	1 (8.3)	0 (0.0)	
<b>Long</b>	1 (8.3)	3 (4.1)	
<b>Umbilical Cord Around the Neck</b>			
<b>Present</b>	3 (25)	6 (8.1)	0.09
<b>Absent</b>	9 (75)	68 (91.9)	
<b>APGAR Score</b>			
<b>≥7</b>	9(75.0)	68(91.9)	0.108
<b>&lt;7</b>	3(25.0)	6(8.1)	

Among the group-A participants, 25% had umbilical cord around their necks, while 75% did not, compared to 8.1% of group-B who had umbilical cords around their necks and 91.9% did not. Umbilical cord size was normal for majority of the participants in both groups, 83.3% in group-A and 95.9% in group-B, while 8.3% of the participants of group-A had short and long sized umbilical cords each. Among the group-B participants, none had short umbilical cords, while 4.1% had long umbilical cords. According to APGAR score of the neonates, 25% of group-A and 8.1% of group-B had <7 score, while the remaining

participants of both groups had normal or good health according to APGAR scores. The difference between the two groups in any of these factors were non-significant, except for umbilical cord size

**Table 6:** Distribution of perinatal mortality in relation to meconium stained liquor (n=86)

Perinatal mortality	Group-A (n=12)	Group-B (n=74)	p value**s
Stillbirth	1(8.3)	1(1.4)	0.261
Neonatal death	0(0)	2(2.7)	0.999

\*Fisher's Exact test was done to measure the level of significance.

Group-A faced 1 perinatal mortality, and group-B faced 3 perinatal mortalities. Stillbirth was 1 (8.3%) in group A and 1 (1.4%) in group B, neonatal death was 2 (2.7%) in group B. Overall perinatal mortality in study population (n=86) was 4.6%.

**Table 7:** Distribution of neonatal management in relation to meconium stained liquor (n=86)

Management Procedure	Group-A (n=11)	Group-B (n=73)	p-value*
No resuscitation required	3(27.3)	55(75.3)	<b>0.012</b>
Resuscitation required	3(27.0)	6(8.2)	
Admission on neonatal care unit	5(45.5)	12(16.4)	

\*Chi-square test was done to measure the level of significance.

In group A total alive baby was 11 & in group B total alive baby was 73. Among the alive babies in group-A, no resuscitation was required in 3 (27.3%) cases, resuscitation was required in 3(27.0%) cases and admission in neonatal care unit was required in 5 (45.5%) cases. In group B, no resuscitation was required in 55 (75.3%) cases, resuscitation was required in 6 (8.2%) and admission in neonatal care unit in 12 (16.4%).

## DISCUSSION

High-risk pregnancy is one in which mother, fetus or newborn is or may possibly be at increased risk of morbidity or mortality, before, during or after delivery. Perinatal outcome is thought to be more adverse when liquor is stained by meconium, because meconium stained liquor is generally interpreted as one sign of baby possibly being unwell or distressed when inside the uterus. There are limited data available regarding effect of meconium on perinatal outcome in our country. The present study was undertaken to find out and compare perinatal outcome in high-risk pregnancies with meconium stained liquor (group-A) and without meconium stained liquor (group-B). The criteria for identifying high risk cases was according to WHO, while risk scoring was done following Cooplund et al.'s system.<sup>[14]</sup> The present study found that about 9.3% of the total study participants were severe high-risk pregnancy cases, while the remaining 90.7% were high-risk cases. These findings were supported by Afroza et al.s' study, where they found 85% high risk pregnancy cases and 15% severe high-risk pregnancy cases.<sup>[15]</sup> Among the 12 group-A participants, 25% were severe high-risk pregnancy cases, compared to 6.76% among the group-B participants. Frequency of antenatal care was regular for most of the cases among both groups. Hypertensive disorders and diabetes had similar

frequency among both groups, while prolonged pregnancy was much higher at 33.3% in group-A, compared to 16.2% in group-B. Premature rupture of the membrane was observed in 16.7% cases of group-A and 8.1% of group-B participants. Although these complications were at a higher frequency among the participants of group-A, the difference between the two groups were not statistically significant. Regular antenatal care was observed in similar high frequency in both of the groups. This was different compared to other maternal studies conducted in Bangladesh where the frequency of antenatal care is generally low among the population. The reason behind this could be that all the participants of our study were high-risk pregnancy cases, and required better care from the start. The duration of gestational weeks was almost similar among the two groups, with no statistically significant difference. Among the neonatal characteristics of the participants, umbilical cord size was a significant factor. In group-A, 83.3% had normal umbilical cord size, 8.3% had short and another 8.3% had long umbilical cord size. On the other hand, among the group-B participants, 95.9% had normal sized umbilical cords, and 4.1% had long umbilical cords. Among the group-A participants, 25% had umbilical cords around the neck of their babies, while only 8.1% had of group-B participants had umbilical cords around the neck of their neonates. However, this difference was not statistically significant. According to APGAR scores, majority of the neonates from both groups had normal or good health with no statistical difference between the groups. In the present study, stillbirth was 8.3% in group A in comparison to 1.4% in group B, while neonatal death was 2.7% in group B and 0% in group-A. In group A, stillbirth was due to abruption placenta, consequence of hypertension. In group B stillbirth was due to chronic placental insufficiency consequences of various medical disorders. In group B neonatal death was due to low

birth weight, prematurity. Perinatal mortality in group A was 8.3%, which was higher compared to another study by Irin et al.<sup>[16]</sup> This difference might be due to the difference in sample size among the groups, as well as our study having only high-risk pregnancy cases, which probably played an important role in maternal and neonatal mortality and morbidity. The difference between the neonatal morbidity cases were not significant in our study. For management procedure among the 11 live births of group-A and 73 live births of group-B, majority of group-B participants did not require resuscitation, compared to 8.2% who needed resuscitation, and 16.4% who had admission at the neonatal care unit. Among the Group-A participants however, 27.3% had no need for resuscitation, 27.3% required resuscitation, and 45.5% required admission on the neonatal care unit. The difference between these two groups in regards to management was statistically significant.

#### Limitations of The Study

The study was conducted in a single hospital with small sample size. So, the results may not represent the whole community.

#### CONCLUSION

The study observed that participants with meconium stained liquor amnii were at higher risk in all factors. Severe high risk pregnancy cases had higher frequency among those with liquor amnii. Comparing the various factors of maternal and neonatal health among the participants, it was observed that umbilical cord size and neonatal management were the only significant factors among participants with and without meconium stained liquor.

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**Conflict of interest:** None declared

**Ethical approval:** The study was approved by the Institutional Ethics Committee

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