

Frequency of Grades of Meconium-Stained Liquor and Compare the Frequency of Fetal Outcome according to Grades of Meconium-Stained Liquor

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ABSTRACT

Objective: To determine the different grades of meconium-stained liquor and association of fetal outcome (still birth, poor Apgar score, NICU admissions) among meconium-stained liquor patients according to their grades.

Subject and Methods: This prospective case series study was conducted at the department of obstetrics and Gynaecology, civil Hospital Karachi, for 6 months from April 2019 to September 2019. After per vaginal examination meconium-stained amniotic liquor and grades of meconium-stained liquor were confirmed and these patients were monitored by auscultation of fetal heart sounds by pinard stethoscope and cardiotocography performed and when patients delivered, the frequency of fetal outcome according to grades noted and was documented on pre-designed proforma.

Results: A total of 150 patient women were studied, their average age was 28.62±4.19 years and mean gestational age was 38.38±1.00 weeks. There 56% multiparous women. Of all meconium-stained liquor, grade II was commonest 40%, grade I 30% and grade III 30%. Still birth was 2.0%, poor Apgar score was 24.7% and rate of NICU admission was 28.0%. Maternal age, parity and gestational age effects were statistically significant on grade of liquor ($p < 0.05$).

Conclusion: Meconium-stained liquor grade II was observed to be high. The adverse fetal outcomes in terms of still birth, low Apgar score and neonatal intensive care unit admission were observed to the significance associated with meconium-stained liquor grades II and III. Meconium-stained amniotic fluid as a serious problem so early decision should be taken to improve the fetal outcome.

Keywords: Meconium-stained amniotic fluid, still birth, poor Apgar score

INTRODUCTION

Meconium passage in newborns is a biologically programmed event that occurs during the first 24 to 48 hours following birth.¹ During gestation, however, the foetus may pass the meconium in the amniotic fluid for various reasons. Before 37 weeks of pregnancy, meconium-stained amniotic fluid is uncommon, and the likelihood of meconium-stained amniotic fluid raises with raising the gestational age.^{1,2} The prevalence of meconium-stained amniotic liquor varies between 7% and 22%.^{3,4} Meconium aspiration syndrome (MAS) develops in about 5% of all MSAF cases. With such a newborn rate of death of 49 per 1000 live births, Pakistan is ranked third among the 10 countries that account for two-thirds of all neonatal deaths worldwide.^{3,5} It is unclear what causes meconium-stained amniotic liquor.¹ Previous studies have indicated that obstetric factors (post term pregnancy, prolonged labour, oligohydramnios, lower birth weight, pregnancy hypertensive disorders and IUGR), medical status (anemia and cholestasis of pregnancy), and behavioral and socio-demographic risk factors (maternal drug abuse like cocaine, raised maternal age and smoking) are indeed the significant factors that contribute to meconium passage into the uterus.^{1,6} Many professionals rated amniotic fluid meconium stained to determine fetal status and outcome based on its colour, consistency, and time of presentation after membrane rupture. Grade 1 amniotic fluid discoloration occurs when a tiny amount is diluted in a large amount of amniotic fluid, resulting in a slightly yellowish or greenish discoloration.⁷ When a substantial amount of meconium stains the amniotic fluid, resulting in a khaki colour, it is classified as grade -II. Heavy staining occurs when there is a lack of amniotic fluid and a substantial amount of meconium, resulting in a thick staining that has a "peasoup" consistency.^{7,8} When compared with clean amniotic fluid, meconium-stained amniotic fluid has been linked to a higher rate of neonatal morbidity.⁹ In compared with clear liquor, thick meconium is linked to increased morbidity and death and is also linked to a higher rate of emergency cesarean deliveries.⁹ Meconium aspiration into the newborn respiratory tract is linked to

neonatal morbidity and the mortality, as well as mild to severe respiratory compromise. Long and short-term fetal outcomes are adversely affected by meconium-stained amniotic fluid; in particular, rates of newborn resuscitation, distress, low Apgar score, respiratory distress, neonatal admission in a nursery, sepsis, meconium aspiration syndrome, and pulmonary disease are elevated. As a result, higher grades of meconium-stained liquor are linked to poor perinatal outcomes, as is the link between meconium-stained liquor and aberrant cardiotocography, which is linked to poor perinatal outcomes, higher cesarean section rates, and increased neonatal problems. The goal of this study was to assess the frequency of different degrees of meconium-stained liquor and its association with adverse fetal outcomes in patients with meconium-stained amniotic fluid based on their grades in a tertiary care hospital.

MATERIAL AND METHODS

This prospective case series study was carried out at the department of obstetrics and Gynaecology, civil Hospital Karachi, during 6 months from April 2019 to September 2019. Non-probability consecutive sampling technique was used. All the patients aged 19-45yrs, both multi and primipara, age patients in labor as per clinical examination and cephalic presentation, singleton pregnancy, and having gestational age 37-42 weeks were included. All the patients with gestational age <37 weeks and more than 42 weeks, history of previous C/S, congenital malformation, or twin pregnancy, gestational diabetes mellitus and women with pre-eclampsia were excluded. After per vaginal examination meconium-stained amniotic liquor and grades of meconium-stained liquor were confirmed and these pts were monitored by auscultation of fetal heart sounds with pinard stethoscope and Cardiotocography performed and when patients delivered frequency of fetal outcome according to grades noted and was documented on pre-designed proforma. All the assessment was done under the supervision of a consultant having >5-year' experience. All the information was collected via study proforma. Data were entered and analyzed through SPSS

version 26.

RESULTS

A total of 150 patient women were studied. The average age of the women was 28.62±4.19 years. Mean gestational age was 38.38±1.00 weeks. Regarding the parity of the women, there were 45(30%) primiparous, 84(56%) multiparous and 21(14%) grand multiparous. Among all cases 30% had grade I, 40% cases grade II and 30% cases had grade III liquor. The rate of still birth, poor Apgar score and NICU admission were significantly higher in grade III as compare to group I and II, as shown in table 1.

Stratification analysis was performed and observed the grade of liquor was among the age group, parity, gestational age. The effect of age was not statistically significant (table 3) while the parity and gestational age effect was statistically significant on the grade of liquor as shown in table 2

Table 1. descriptive statistics of characteristics and fetal outcome of patients n=150

Variables	Statistics	
Age (Years)	28.62±4.19	
Gestational Age (Week)	38.38±1.00	
Parity	Primiparity	45(30.0%)
	Multiparity	84(56.0%)
	Grand multiparity	21(14.0%)
Liquor grades	Grade I	45(30.0%)
	Grade II	60(40.0%)
	Grade III	45(30.0%)
Fetal outcome	Asymptomatic	68(45.3%)
	Still birth	3(2.0%)
	Poor Apgar score	37(24.7%)
	NICU admission	42(28.0%)
Apgar Score at 1min	5.79±0.70	
Apgar score at 5 min	6.92±.81	

Table 2. Fetal outcome according to the grades of meconium-stained liquor n=150

Variables	Grade of Liquor			P-Value	
	Grade I	Grade II	Grade III		
Adverse fetal outcome (n=81)	Still Birth	--	01	02	0.001
	Poor ApgarScore	3	14	20	
	NICU Admission	3	16	23	
Age groups	≤ 25 Years	9	18	12	0.056
	26 to 30 Years	21	36	21	
	>30 Years	15	6	12	
Parity	Primiparity	9	21	15	0.0005
	Multiparity	21	39	24	
	Grand Multiparity	15	--	6	
Gestational age	37 to 38	18	24	33	0.001
	>38	27	36	12	

DISCUSSION

A substance, which accumulates in the fetal bowel during the intrauterine life is called meconium. Around 69 percent of neonates pass meconium by the time they reach 12 hours of age, while some fetuses pass meconium even before birth.¹⁰ Meconium in amniotic fluid is a potentially dangerous indicator of foetal impairment and has been linked to higher perinatal mortality rates and morbidity.¹¹ Low Apgar scores, a higher rate of chorioamnionitis, an increased incidence of neonatal intensive care hospitalization, and a higher incidence of perinatal death have all been linked to it.¹² This study has been done to assess the different grades of meconium-stained liquor and its association with fetal outcome among meconium-stained liquor patients. In this study, out of all 30% had grade I, 40% cases grade II and 30% cases had grade III liquor, and furthermore we found that the rate of still birth, poor Apgar score and NICU admission were significantly high in grade III compared with grade I and grade II. Consistently Sarmishta M et al¹³ reported that the 9.1% cases had grade 1 meconium stain liquor, 30.9% had Grade 2 and 60.0% of the cases had grade 3 meconium stain liquor, while inconsistently they did not find a significant association of meconium stain liquor grading with fetal outcome. In the line of this study, Mohan M et al¹⁴ reported that the out of 130 study participants, meconium-stained liquor grade 2 was common among 56.2%, followed by meconium-stained liquor grade 3 in 30.7% of the cases and meconium-stained liquor grade 1 in only 13.1% of the cases and they found that meconium aspiration syndrome was higher among fetuses born with complicated deliveries to liquor grade 3. Though it's difficult to tell whether meconium-stained liquor is a pathologically or physiologically, there's some evidence that it is linked to meconium aspiration syndrome, neonatal sepsis, respiratory distress, operative delivery, resuscitation, NICU admission, and a low Apgar score.¹⁵

In this study the average age of the women was 28.62±4.19 years and mean gestational age was 38.38±1.00 weeks. Similarly, in the study of Mohan M et al¹⁴ reported that the bulk of the participants in the study were between the ages of 20 and 25, accounting for 41.5 percent of the total. On other hand, Kumari R

et al¹⁶ conducted the study to evaluate the perinatal outcomes and delivery method in women who have meconium-stained liquor during labour and they demonstrated that the mean age of the study subjects was 29.92±3.41 years and average gestational age was 40.53±1.48 weeks. In this study, primiparous women were 30%, 56% were multiparous and 14% were grand multiparous. Consistently, Kumari R et al¹⁶ reported that out of all study subjects 42.7% women were nulliparous, 37.3% were multiparous and 20% women had parity of more than five.

In this study as per fetal outcome still birth were 3(2.0%), poor Apgar score was in 37(24.7%) of the cases and rate of the NICU admission was 42(28.0%). Alternatively, in the study of Priyadharshini, M et al¹⁷ reported that 14% neonates required NICU admission, 48.57% underwent ventilator support, meconium aspiration syndrome occurred in 40% newborns and severe birth asphyxia occurred in 14.28% of the cases. In the study of Kumari, R et al¹⁶ reported that the 17.3% newborns had Low Apgar Score <7, 40% ha low birth weight, birth asphyxia was present in 1.3% cases, and most of the newborns 84.0% were asymptomatic. Meconium aspiration syndrome affects between 5 and 10.5 percent of neonates who have meconium-stained fluid, accounting for about 12% of neonatal deaths.^{18,19} Short and long-term consequences of meconium fluid aspiration include increased low Apgar score, sepsis, respiratory distress, neonatal resuscitation, neonatal hospitalizations and the meconium aspiration syndrome. In addition to severe mental impairment and cerebral palsy, a newborn born with meconium fluid aspiration has a high risk of cerebral palsy.¹⁸ The negative effects of meconium-stained amniotic fluid are significantly severe in developing nations because to various factors related to socioeconomic status and service standards.¹ However, there is a scarcity of knowledge regarding the conditions in developing countries also, particularly in the research area, to develop effective preventive methods.

CONCLUSION

Meconium-stained liquor grade II was observed to be high. The adverse fetal outcome in terms of still birth, low Apgar score and neonatal intensive care unit admission were observed to the

significance associated with meconium-stained liquor grade II and III. The passage of meconium remains an enigma to the obstetrician and equally worries the pediatrician. Poor socioeconomic status, unbooking status and ignorance in the antenatal care mostly were seen in the cases. However, the risk factor related large-scale studies are recommended to develop the preventive strategies to decrease the fetal adverse outcome.

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