

## Foetal outcome in patients with Meconium Stained Liquor

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### Abstract

**Objective:** To determine the foetal outcome and mode of delivery in patients with meconium stained liquor during labour.

**Methods:** The observational study was carried out at the Obstetrics and Gynaecology Unit-II of Liaquat University of Medical Health Sciences from June to November 2007. The patients with gestational age more than 37 weeks who presented with meconium stained liquor and cephalic presentation were included and the foetal outcome and mode of delivery was assessed in all such subjects. The data was collected on pre-designed proforma and analysed using SPSS version 10. Chi square test was applied with 95% confidence interval and p-value  $\leq 0.05$  was considered significant.

**Results:** A total of 75 patients with meconium stained liquor were identified during the study period. The patients with reactive cardiotocography (CTG) were 50(66.7%) and with non-reactive CTG, 25 (33.36%). Of the total, 45(60%) patients were delivered through normal vaginal delivery, while 30(40%) were delivered by caesarean section. The rate of instrumental delivery was also increased which was 12(26.7%). Among the neonates exposed to meconium stained liquor, 62(82.7%) babies were delivered with apgar score  $>7$ . Only 13(17.3%) babies were delivered with apgar score  $<7$  in one minute.

**Conclusion:** Meconium stained amniotic fluid is a common occurrence during labour and is associated with increased caesarean section rate and foetal morbidity and mortality.

**Keywords:** Cardiotocography, Foetal heart rate, Meconium stained liquor, Meconium aspiration syndrome (JPMA 62: 474; 2012).

### Introduction

Foetal distress is defined as alterations in the foetal heart rate (FHR) more commonly bradycardia and the passage of meconium in response to the underlying foetal hypoxia. Variation in FHR, passage of the meconium in the amniotic fluid, non-reactive CTG and decreased foetal scalp blood pH<sup>1</sup> are strong indicators of foetal distress. Meconium stained amniotic fluid (MSAF) is associated with higher rate of caesarian delivery, increased need for neonatal resuscitation and meconium aspiration syndrome.<sup>2</sup> Higher maternal age, prolonged or premature labour, post-term pregnancy, cholestasis of pregnancy, low-birth weight babies, growth retardation and hypertensive disorders of pregnancy are the major risk factors for the passage of meconium.<sup>3</sup> Aspiration of meconium by the foetus remains a relatively common cause of perinatal morbidity and mortality because it is difficult to prevent.<sup>4</sup> The foetus passes meconium into the amniotic fluid in 10% of all pregnancies; in 5% of these (i.e. 1:200 of all pregnancies) the meconium is aspirated into the lungs of the foetus or the neonate.<sup>4</sup> This can result in severe

respiratory distress, the meconium aspiration syndrome (MAS).<sup>4</sup> Thick meconium by itself is not associated with adverse foetal outcome. However, the incidence of MAS increases in cases of non-reassuring FHR and clinical condition of the newborn at birth.<sup>5,6</sup> The MAS can cause or contribute to neonatal death and in addition up to one third of all cases in which aspiration occurs, develop long-term respiratory compromise.<sup>7</sup> The MSAF is a clinical diagnosis with no practical confirmatory test.<sup>8</sup> However, various methods have been tried to detect the presence of meconium in liquor and to prevent MAS. These methods include aminoinfusion, oropharyngeal suction, endotracheal intubation, aminoscopy, early induction of labour and detection by ultrasonography. In our country, most maternity centers do not have facilities for continuous FHR monitoring, and facilities for foetal scalp blood sampling are not available even in tertiary care hospitals. Thus, in the absence of these facilities there is an unnecessary increase in instrumental vaginal deliveries (IVDs) and caesarian section (CS) rate with increased maternal morbidity and mortality. The

morbidity and mortality associated with MAS can be brought down if the high-risk patients are identified in the antenatal period and careful decisions are made about the timing and mode of delivery and vigilant monitoring of the labour. It means that MSAF is associated with a lot of adverse outcomes for the foetus and the mother. This study was carried out to determine foetal outcome and mode of delivery in pregnant women with meconium stained liquor (MSL).

### Patients and Methods

The observational study was conducted at Gynae Unit-III of Liaquat University Hospital, Hyderabad, from June to November 2007. The inclusion criteria comprised: patients with > 37 weeks of gestational age and presenting with MSL; patients with MSL and cephalic presentation; and patients presenting with light yellow to thick dark green colour liquor (Grade I, II, III) after spontaneous or artificial rupture of membrane. The exclusion criteria included patients with other than cephalic presentation like breech presentation; patients with clear liquor after spontaneous or artificial rupture of membrane; and the non-cooperative patients who refused to give their consent for the participation in the study. The patients who fulfilled the inclusion criteria were evaluated and enrolled in the study by approaching them at the labour ward and explaining to them the procedure and purpose of the study. Informed consent was taken from all of them. Patient's biodata, detailed history, booking status, relevant clinical examination, including general physical examination, per abdomen examination, per speculum, per vaginal examination, and investigations, including intermittent CTG, were recorded on a pre-designed proforma. The patients were carefully watched for progress of labour and were strictly monitored for FHR with sonicaid and CTG. Where needed, augmentation with oxytocin was done. Delivery was expedited, when FHR abnormalities were detected by the safest possible method (IVD or CS). A paediatrician was present for all deliveries and attended to the babies. Those who needed observation were shifted to the intensive care unit as per the paediatrician's advice. Foetal outcomes like low apgar score, low birth weight, birth asphyxia were evaluated and documented.

The Statistical Package for Social Science (SPSS-10) was used to analyse the data. The relevant descriptive statistics, frequency and percentage, were computed for categorical variables like booking status, mode of delivery, stage of labour, parity, gravida, apgar score, CTG and foetal outcome. Mean standard deviation, median and 95% confidence interval were computed for quantitative variables. The chi square test was applied between grades of meconium and apgar score at 95% confidence interval and the p-value ?0.05 was considered to be statistically significant.

### Results

The study population comprised 75 pregnant women with ≥ 37 weeks of gestational age who were identified with MSL. The average age of the patients was 29.92±3.41 (95% CI: 29.13 to 30.71) years. The mean gestational age of the pregnant women were 40.53±1.48 (95% CI: 40.19 to 40.8)

**Table-1: Foetal outcome in patients with meconium stained liquor (n=75).**

Foetal Outcome	Frequency	Percentage
Remained Asymptomatic	63	84.0%
Low Apgar Score (<7)	13	17.3%
Low Birth Weight (<2500gram)	30	40%
Hydrocephalus	00	00%
Birth Asphyxia	01	1.3%
Pre-term Newborn	00	0.0%

**Table-2: Foetal outcome according to grades of meconium.**

Grades	Apgar score <7	Apgar score >7	Total	P- value
I	02 (8.7%)	21 (91.3%)	23 (100%)	0.01*
II	05 (12.8%)	34 (87.2%)	39 (100%)	
III	06 (46.2%)	07 (53.8%)	13 (100%)	
Total	13 (17.3%)	62 (82.7%)	75 (100%)	

\*Statistically significant.

weeks. Of the total, 24 (32%) women were booked and 51(68%) were non-booked. Of the women, 32 (42.7%) were nullipara (parity 0) followed by 28(37.3%) with parity 2-5, and 15(20%) grand multiparous (parity >5). Vaginal deliveries were successful in 45(60%) women, while CS was done in 30(40%) cases. Out of 45 vaginal deliveries, 33(73.3%) were spontaneous vaginal and 12(26.7%) were IVDs. The foetal outcomes were noted (Table-1). Regarding CTG outcome of patients with MSAF, 25 (33.3%) patients had non-reactive CTG, and 50(66.7%) had reactive CTG. The foetal outcomes in relation to the grades of meconium were also noted (Table-2).

### Discussion

The passage of foetal colonic contents in the amniotic cavity causes the MSAF and is a commonly encountered finding in the obstetric practice with an overall frequency between 12% and 19%.<sup>8,9</sup> It is more common in post-term pregnancies and with intrauterine growth restriction.<sup>10</sup> The MSAF is associated with a lot of adverse outcomes and has long been considered to be a bad predictor of foetal outcome.<sup>11,12</sup> The MAS is the most common cause of respiratory disease in terms of infants<sup>13</sup> and has been reported in 6.6% to 30% of cases of MSAF, and 1% to 3% of liveborn infants.<sup>14</sup> The MSAF causes low apgar score at birth, foetal

academia and hypoxia. The emergency CS, IVD for foetal distress, MAS and neuro-developmental handicaps are possible associated problems with MSAF.<sup>15</sup> The MSAF and its associations are still very important determinants of perinatal morbidity and mortality, and a successful management of such pregnancies is possible only after a better understanding of patho-physiology of the meconium passage, and that is why this study was carried out to highlight the reasons.<sup>16</sup>

The incidence of meconium passage during labour increases with gestational age - 30% at 40 weeks and 50% at 42 weeks in a study by Steer et al.<sup>7</sup> The CTG changes commonly reflect mechanical stress on the foetus such as head compression during the second stage of labour.<sup>7</sup> In our study 66.6% patients with MSAF were CTG reactive, while the rest (33.3%), were with non-reactive CTG. In a study by Khazardoost et al, 10.6% patients presented with thin meconium and 89.4% patients presented with thick meconium.<sup>17</sup> It is in contrast to our study as only 17.3% patients presented with grade three liquor. In our study, 60% patients delivered through normal vaginal delivery, and 40% through CS, which is much less than a study by Shaikh,<sup>2</sup> but comparable with study by Karim;<sup>18</sup> Non-reactive CTG affected decision-making. But it is seen that infants delivered through CS have slightly better pH values and apgar score than those delivered vaginally.<sup>19</sup> In one study MAS was observed in 23.7% babies with thick meconium and 3.33% with thin meconium,<sup>20</sup> but in a study by Bhutta, et al it is proved that though MSAF is associated with MAS, there is no association between meconium thickness and severity of the respiratory disease.<sup>6</sup> In our study, 84% babies remained asymptomatic, 17.3% had low apgar score, 40% had low birth weight, and only 1.3% developed birth asphyxia. Vigilant and careful monitoring of high-risk pregnancies can reduce perinatal morbidity and mortality.

### Conclusion

MSAF is a common occurrence during labour. Electronic foetal monitoring, timely obstetrical intervention and paediatric care can reduce associated complications and improve foetal outcome.

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