

## MODE OF DELIVERY AND FOETAL OUTCOME IN MECONIUM-STAINED LIQUOR: A RETROSPECTIVE STUDY

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### ABSTRACT

#### AIMS AND OBJECTIVES

To study the incidence of MSL, mode of delivery and foetal outcome in women with MSL in labour.

#### MATERIALS AND METHODS

A retrospective study was conducted from January 2014 to December 2015 on patients admitted in labour room of Dr. B. R. Ambedkar Medical College and Hospital and assessed for MSL, mode of delivery and foetal outcome.

#### RESULTS

Out of the 1661 deliveries 195 (11.73 %) were complicated with MSL. Chi square test was applied to analyse Grades of meconium and APGAR score at 95 % confidence and p value of < 0.05 was obtained which was statistically significant.

#### CONCLUSION

MSL alone is not an indication for Caesarean Section and is not associated with adverse neonatal outcome. Increase in the grades of MSL is associated with more adverse outcome.

#### KEYWORDS

Meconium stained liquor, APGAR score, Meconium Aspiration Syndrome, Normal vaginal delivery, Instrumental delivery, Caesarean section.

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**INTRODUCTION:** The presence of meconium in amniotic fluid is relatively common and its incidence ranges from 12 to 20%.<sup>(1)</sup> Obstetrical practice throughout the past has included the concept that MSL is a potential warning of foetal asphyxia. Although 12 to 20% of labours are complicated by MSL, only few are linked to infant mortality.<sup>(2)</sup>

The theories suggested to explain foetal passage of meconium in utero are in response to hypoxia, represents normal gastrointestinal tract maturation under neural control and third, meconium passage may follow vagal stimulation from common transient umbilical cord entrapment and resultant increased gut peristalsis.<sup>(2)</sup> Thus, meconium release could also be physiological.<sup>(2,3)</sup> However, in prolonged pregnancy, the fluid becomes more scanty and viscous and the presence of meconium can lead to Meconium Aspiration Syndrome (MAS).<sup>(3)</sup> The majority of infants (97%) born through MSL will not develop MAS.<sup>(4)</sup>

The meconium staining of amniotic fluid is classified as Grade 1, 2 and 3. By visual inspection 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 in colour.

Meconium passage is rare before 34 weeks of gestation and increases steadily after 38 weeks' gestation.<sup>(4)</sup> Risk

factors for MSL are post-dated pregnancies, placental insufficiency, pre-eclampsia, eclampsia, oligohydramnios, intrauterine growth restriction.<sup>(4,5)</sup>

High incidence of meconium observed during labour often represents foetal passage of gastrointestinal contents in conjunction with normal physiological process; however, such meconium becomes environmental hazard when foetal acidemia supervenes.<sup>(2)</sup> Though rare (1%), aspiration of meconium by foetus (MAS) causes perinatal morbidity and mortality as it is difficult to prevent.<sup>(6)</sup> Meconium-stained liquor is a clinical diagnosis and no practical confirmatory tests are available though various methods have been tried to detect presence of meconium in liquor and to prevent MAS.<sup>(7)</sup> These methods include amnioscopy during labour, oropharyngeal suction and endotracheal intubation after delivery.

The APGAR score is a practical method of systematically assessing newborn infants after birth. The parameters evaluated are Heart rate, Respiratory effort, Muscle tone, Colour and Response to catheter in nostril.<sup>[8]</sup> The APGAR scoring system remains as relevant for the prediction of neonatal survival today as it was almost 50 years ago.<sup>[9]</sup>

#### OBJECTIVE:

- To study the incidence of meconium stained liquor (MSL) in referral centre.
- To study the mode of delivery in patients with MSL.
- To assess the foetal outcome in patients with MSL.

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**MATERIALS AND METHODS:** A retrospective study was conducted from January 2014 to December 2015 on patients admitted in Dr B.R. Ambedkar Medical College and Hospital Labour room. The labouring women were assessed for MSL, their mode of delivery and foetal outcome. The inclusion criteria were singleton, cephalic presentation, >37 weeks pregnancies with MSL. Patients with previous Caesarean pregnancies, multiple pregnancies, <37 weeks gestation, non cephalic presentation were excluded from the study. Foetal outcome was assessed by record of APGAR score. The mode of delivery and foetal outcome assessed from labour data records. The data was collected on predesigned proforma. The Grades of meconium, APGAR and mode of delivery were recorded.

**RESULTS & OBSERVATION:** A retrospective study was conducted from January 2014 to December 2015 on patients admitted to labour room of Dr B.R. Ambedkar Medical College and Hospital. Out of the total 1661 deliveries over two years, 195 (11.73 %) were complicated with MSL. This correlated with the incidence cited in text books.<sup>(1,2)</sup>

Total no. of deliveries	Delivery complicated by MSL
1661	195

**Table 1: Deliveries Complicated by MSL**

Post-dated pregnancy	86
Pre-eclampsia	19
Oligohydramnios	9
Intrauterine Growth Restriction	6
Gestational Diabetes Mellitus	2
Rh Isoimmunisation	1
Maternal age > 35 years	4

**Table 2: Antenatal Risk Factors in the present Study**

Grade 1 MSL	Grade 2 MSL	Grade 3 MSL
78(40 %)	89(45.6 %)	28(14.35 %)

**Table 3: Distribution of Grades of Meconium**

Out of 195 deliveries complicated by MSL, 78 were Grade 1, 89 were Grade 2 and 28 were Grade 3 MSL.

GRADES OF MSL	APGAR < 6	APGAR > / = 6
1	11(14.1 %)	67(85.89 %)
2	17(19.1 %)	72(80.9 %)
3	6(21.4 %)	22(78.6 %)
TOTAL	34(17.43 %)	161(82.5 %)

**Table 4: Foetal Outcome (APGAR score) according to Grades of MSL**

Chi-square test was applied to analyse above Grades of meconium and APGAR score at 95% confidence and p value of < 0.05 obtained which was statistically significant.

Grades of MSL	Normal Delivery	Instrumental Delivery	LSCS
1	59(75.6 %)	2(2.56 %)	17(21.8 %)
2	57(64 %)	3(3.37 %)	29(32.6 %)
3	9(32.14 %)	1(3.57 %)	18(64.3 %)
<b>Total</b>	<b>125(64.1 %)</b>	<b>6(3.07 %)</b>	<b>64(32.8 %)</b>

**Table 5: Mode of Delivery according to Grades of MSL**

In this study, 64% had Normal Delivery, 3% instrumental delivery and 32.8% had LSCS. The incidence of LSCS was high (64.3 %) with Grade 3 MSL.

**DISCUSSION:** The presence of MSL is common at 12 to 20%. Meconium may be passed in variety of clinical settings. The majority of infants born with MSL will not develop MAS.<sup>(4)</sup> Meconium passage cannot be predicted, timed or prevented accurately. Hence, high risk pregnancies should be monitored meticulously in labour.

MSL alone is not an indication for Caesarean Section; however, labour complicated by MSL needs strict supervision of Foetal Heart Rate in labour.

All babies with MSL need not receive active management. An active, crying, well-appearing baby does not require Endotracheal Intubation regardless of presence of meconium or thickness of meconium. If newborn is in distress then appropriate intervention of suctioning and intubation is to be undertaken.<sup>(4)</sup>

MSL during labour is associated with increased rate of Emergency LSCS, instrumental deliveries for foetal distress, MAS and Neurological development handicaps. Infants with APGAR<6 at 5 minutes are three times more likely to develop abnormalities on neurological examination.<sup>(10)</sup>

In our study, there were total of 1661 deliveries. MSL was present in 195 (11.73%) deliveries, Grade 1 in 78 (40%) Grade 2 in 89 (45.6%) and Grade 3 in 28 (14.35%). Meena et al in their study, out of 2124 deliveries 250 (11.7%) had MSL, Grade 1 MSL in 86 (34.5%), Grade 2 MSL in 102 (40.8%) and Grade 3 MSL in 62 (24.8%).<sup>[11]</sup> Nirmala et al in their study, out of 1267 deliveries 100 (7.89%) had MSL, Grade 1 in 39%, Grade 2 in 43 % and Grade 3 in 18%.<sup>[12]</sup>

In our study, out of 195 deliveries the potential antenatal risk factors were post-dated pregnancy (86), pre eclampsia (19), oligohydramnios (9), intrauterine growth restriction (6), gestational diabetes (2), maternal age >35 years (4).

In our study , in Grade 1 MSL 11 (14.1%) babies were born with APGAR < 6 and 67 (85.89%)with APGAR > / = 6 , in Grade 2 MSL 17 (19.1%) had APGAR < 6 and 72 (80.9%) had APGAR > / = 6 , in Grade 3 MSL 6 (21.4%) babies had APGAR < 6 and 22 (78.6%) had APGAR > / = 6 . Total of 34 (17.43%) babies had APGAR < 6 and 161 (82.56%) had APGAR > / = 6. Comparing this with Meena et al study , in Grade 1 MSL, 12 (13.95%) had APGAR < 7 and 74 (86.04%) had APGAR > / = 7, in Grade 2 MSL 15 (14.7%) had APGAR < 7 and 87 (85.29%) had APGAR > / = 7, in Grade 3 MSL 20 (32.25%) had APGAR < 7 and 42 (67.74%) had APGAR > / = 7, totally 47 (18.8%) had APGAR < 7 and 203(82.2%) had APGAR > / = 7.<sup>[11]</sup>

In our study, in Grade 1 MSL 59 (75.6 %) had Normal vaginal delivery, 2 (2.56 %) had Instrumental delivery and 17 (21.8 %) had LSCS. In Grade 2 MSL 57 (64 %) had Normal vaginal delivery, 3 (3.37 %) had Instrumental delivery and 29 (32.6 %) had LSCS. In Grade 3 MSL 9 (32.14 %) had Normal vaginal delivery, 1 (3.57 %) had Instrumental delivery and 18 (64.3 %) had LSCS. Totally out of 195 deliveries complicated with meconium 125 (64.1 %) had Normal vaginal delivery, 6 (3.07 %) had Instrumental delivery and 64 (32.8 %) had LSCS. The incidence of LSCS increased as the grades of meconium increased with Grade 3 having 64.3 % LSCS rate. Meena et al in their study, in Grade 1 MSL 46 (53.48 %) had Normal vaginal delivery, 17 (19.76 %) had Instrumental delivery and 23 (26.74 %) had LSCS, in Grade 2 MSL 36 (35.29 %) had Normal vaginal delivery, 26 (25.49 %) had Instrumental delivery and 40 (31.29 %) had LSCS, in Grade 3 MSL 4 (6.45 %) had Normal vaginal delivery, 15 (24.19 %) had Instrumental delivery and 43 (69.35 %) had LSCS, totally 86 (34.4 %) had Normal vaginal delivery, 58 (23.2 %) had Instrumental delivery and 106 (42.4 %) had LSCS.<sup>[11]</sup>

**CONCLUSION:** Meconium stained liquor is common with incidence between 12 to 20 %. MSL alone is not an indication for Caesarean Section and is not associated with adverse neonatal outcome. 64.1 % had Normal vaginal delivery with 82.5 % of 195 babies having APGAR  $\geq$  6. Increase in the grades of MSL is associated with more adverse outcome. However awareness of high risk pregnancies associated with MSL is necessary. Labour complicated with MSL needs supervision and monitoring of Foetal Heart Rate during labour. Progress of labour and Foetal Heart Rate should decide the mode of delivery. APGAR score should be assessed at delivery and neonatal resuscitation should be individualised.

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