



PERINATAL OUTCOME OF MECONIUM STAINED LIQUOR IN TERM, PRE-TERM & POST-TERM PREGNANCY

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Meconium aspiration is commonly defined as the presence of meconium below the vocal cords. Meconium aspiration is more common if the meconium is thick rather than thin. This may be a reflection of the fact that oligohydramnios (and therefore thick undiluted meconium) is more likely to lead to fetal hypoxia due to cord compression and consequently increased fetal breathing.

Aim: To determine the incidence of cases having meconium stained liquor during labour. To classify the total no. of cases with meconium stained liquor in labour on the basis of gestational duration (term, pre-term and post-term), as well as mode of delivery. To correlate the perinatal outcome with incidence of meconium staining of liquor during labour. To reduce perinatal mortality & morbidity.

Materials And Methods: The present study was conducted at Darbhanga Medical College and Hospital, during the period of December 2018 to November 2020. During the study period, total number of deliveries was 3500, the number of cases selected for the study were 1680. Intrapartum meconium stained liquor was present in 165 cases (11.01%). Cases with clear liquor in the intrapartum period 1495 cases (88.99%) were taken as controls.

Result: No significant correlation was noted between maternal age and meconium staining of liquor. The incidence of staining was higher i.e. 17.1% in higher gestational age of fetus i.e. 41-42 weeks. Our study also yielded results of rising incidence of low-birth weight babies (less than 2.5kg) in meconium stained liquor cases. Instrumental vaginal deliveries and caesarean sections were found to be more prevalent in these cases. Mean Apgar Scores were significantly lower in cases complicated with thick stained liquor than in thin stained liquor or clear liquor.

Conclusion: It can be said that our study has revealed some results that further establishes some well-known facts about meconium stained liquor. Meconium stained liquor is a very common complication during labour and its incidence is 11.01% as per this study. Incidence of instrumental vaginal delivery and caesarean section is significantly increased when liquor is meconium stained during labour.

KEYWORDS

Meconium Stained Liquor, Gestational Duration, Apgar Scores, Perinatal Outcome.

INTRODUCTION

Meconium, the gastrointestinal excreta of fetus was named by Aristotle. The word meconium is derived from Greek "mekonion" meaning "from poppy" or "like opium". He believed that the substance caused sleeping state of the fetus in the mother's womb.¹

Obstetricians and midwives even in the ancient days of Hippocrates were concerned about the grave outcome of labour when liquor was stained with meconium in labour. Contrary to the earlier belief that passage of meconium was a sure sign of fetal death, Schwarz (1858) recognized that it was an indication of diminution of placental exchange of oxygen.²

The fetus passes meconium into the amniotic fluid in about 10% of all pregnancies. In cases of meconium stained liquor there is 5% chance of meconium aspiration which can lead to meconium aspiration syndrome (MAS). Meconium aspiration syndrome can cause or contribute to neonatal death in up to 0.05% (i.e. 1 in 2000 of all pregnancies). In addition, up to one third of all cases in which aspiration occurs develop long term respiratory compromise.³

Meconium is viscous, semi-solid material rich in polysaccharides and contains lipids, digestive secretions, cellular debris, lanugo hair, vernix caseosa, steroids, sterols and sometimes occult blood. Meconium is passed into the amniotic fluid by peristalsis of fetal gut accompanied by relaxation of the internal and external anal sphincters. Formation of Meconium in fetal gut start from 10 weeks of gestation, but passage of meconium is rare before 32 weeks. The incidence of meconium passage increases with gestational age and reaches approximately 15% to 20% at term.⁴

The presence of meconium in amniotic fluid may reflect fetal gastrointestinal maturity or fetal hypoxia or following vagal stimulation from transient umbilical cord entrapment and resultant increased peristalsis. Aspiration of meconium into fetal or neonatal lung is associated with clinical disease ranging from mild respiratory distress to severe respiratory compromise. Meconium aspiration is

commonly defined as the presence of meconium below the vocal cords. Meconium aspiration is more common if the meconium is thick rather than thin. This may be a reflection of the fact that oligohydramnios (and therefore thick undiluted meconium) is more likely to lead to fetal hypoxia due to cord compression and consequently increased fetal breathing.⁵

With the decline of maternal mortality and morbidity over the past few decades, modern obstetricians are much more concerned about the well-being of the fetus. Management of labour complicated by meconium stained amniotic fluid is still a widely debated subject. Many obstetricians consider it as an ominous sign to continue the labour. With the availability of cardiotocogram, continuous electronic fetal heart rate monitoring is possible now and labour can be monitored more efficiently. Amnioinfusion was introduced as an important intervention to prevent meconium aspiration syndrome, but with time, opinion regarding its beneficial effect seems to be divided. There is also controversy regarding intrapartum suctioning of the newborn and endotracheal intubation and suctioning. Meconium stained amniotic fluid is still associated with increased incidence of caesarean section, instrumental vaginal delivery and adverse perinatal outcome. In the context of these conflicting and controversial observations regarding meconium staining of amniotic fluid in labour, the present clinical study was done to find out its significance in respect of perinatal mortality and morbidity.^{6,7}

AIMS AND OBJECTIVES

- 1) To determine the incidence of cases having meconium stained liquor during labour.
- 2) To classify the total no. of cases with meconium stained liquor in labour on the basis of gestational duration (term, pre-term and post-term), as well as mode of delivery.
- 3) To correlate the perinatal outcome with incidence of meconium staining of liquor during labour.
- 4) To reduce perinatal mortality & morbidity.

MATERIALS AND METHODS

The present study was conducted at Darbhanga Medical College and Hospital, during the period of December 2018 to November 2020. Cases were selected from expectant mothers who were admitted for confinement in the department of Obstetrics & Gynaecology.

INCLUSION CRITERIA

- Patient in active phase of labour
- Term pregnancy
- Pre-term pregnancy
- Post-term pregnancy
- Singleton fetus
- Cephalic presentation

EXCLUSION CRITERIA

- Pregnancy with hypertension
- Post caesarean pregnancy
- Multiple pregnancy
- Antepartum hemorrhage
- Diabetes in pregnancy
- Breech presentation

During the study period, total number of deliveries was 3500, the number of cases selected for the study were 1680. Intrapartum meconium stained liquor was present in 165 cases (11.01%). Cases with clear liquor in the intrapartum period 1495 cases (88.99%) were taken as controls.

Following selection of the cases, a detailed history was recorded in the labour room including age, parity, previous obstetrical, medical, surgical history, history of present pregnancy for any abnormality, whether the labour was spontaneous or induced. Mothers were examined clinically to find out the presentation, position, amount of liquor and height of fundus. Assessment of pelvis and the cervix were also done. Use of any medication like oxytocin, analgesics and sedatives were noted.

Time of rupture of membranes and appearance of meconium were noted. When meconium appeared either at the time of rupture of the membranes or after sometime during the course of labour, a speculum examination was done after taking proper aseptic precautions to collect the meconium stained liquor over the speculum to a test tube for clinical quantitative gradation depending on the consistency and colour. When liquor was light green in colour it was considered as thin staining, yellow as moderately thick and deep green as thickly stained (Barham et al, 1969). At the time of detection of meconium stained liquor, position and station of the head, effacement and dilation of the cervix was noted.

Fetal heart was auscultated every 15 minutes with stethoscope and/or Doppler.

During delivery any abnormality of cord & placenta was noted. Pediatrician was present during delivery of cases with meconium stained liquor. Oropharyngeal and/or nasopharyngeal suction, laryngoscopy and suction, endotracheal intubation was done according to the condition of the newborn. Condition of the newborn was assessed by Apgar score at 1 min, 5 min, and 10 min. after birth.

RESULT AND DISCUSSION

Meconium is a dark green liquid passed normally by the newborn baby containing bile, mucus & epithelial cells. The presence of meconium in amniotic fluid in cephalic presentation was of great concern even to the midwives and obstetrician of old age. Passage of meconium, once thought to be a sure sign of fetal death 'in utero', was later understood to be an evidence of fetal hypoxia (James Walker, 1954).⁸ Even the modern obstetricians can not be indifferent at the sight of meconium stained liquor during labour which calls for close vigilance of the fetal well-being.

Incidence of meconium stained liquor widely varies as reported by different workers. In previous studies incidence varied between 7% and 22%.¹⁰ In the present study, the incidence of intrapartum meconium stained liquor was 20.7% (Table – 1) which is consistent with the previous studies.

Barham (1969)¹¹ classified meconium stained liquor into three groups according to different colours – light (50.82%), yellow (19.3%) and dark green (29.85%). In the present study, meconium stained liquor

was classified into three grades. There were 50.2% in thin staining group, 25.9% were moderately stained and 23.92% were thickly stained. Sankhyan Naveen et al (2006)¹² has shown thickly stained liquor in 56.8% of all cases with meconium, but they subdivided meconium stained liquor into thin and thick group. Our study was consistent with the study of Barham et al.¹¹

Our results are similar to the study conducted by Sheiner in 2002, showing 78% of cases having thin meconium stained amniotic fluid and 22% with thick meconium.¹³ In post term pregnancies the incidence varies from 28-52% as seen by Ostrea and Nagvin in 1982.¹⁴ The "thickness" of meconium had a direct bearing on the neonatal outcome.

Scott et al in 2001 also reported similar incidence of neonatal admissions in nursery ($P < 0.001$).¹⁵ Based on our study we can conclude that meconium stained amniotic fluid is associated with increased incidence of caesarean section, lower APGAR score, more neonatal nursery admissions and meconium aspiration syndrome (MAS).

In present study, there was no statistically significant correlation between maternal age and meconium stained liquor, although incidence was relatively higher in maternal age group of 35 years and more. Sankhyan Naveen et al (2006)¹² found increased incidence of thick meconium when maternal age group was above 30 years. So, the result of our study matches with them.

On the contrary, David Leslie (1959)¹⁶ recorded slightly higher incidence in multigravidae. In the present study, there was no significant correlation between gravidity and meconium stained liquor. This finding was consistent with the study of R. Manganaro et al (2001).¹⁷

In the present study also, maximum incidence i.e. 17.1% was noted in 41-42 weeks gestational age group but no significant difference with other groups in between 37 and 42 weeks. R. Manganaro et al (2001) found similar results.¹⁷

Incidence of instrumental vaginal delivery in the meconium stained group (3.3%) was significantly increased when compared to control group (0.9%) in the present study. Similarly in the present study incidence of caesarean section was significantly increased in stained group (44.6%) when compared to control (27.7%).

In the present study it was seen that when meconium was detected at cervical dilatation of 5 cm or less, there was increased incidence of caesarean section (54.5%), compared to detection at dilatation of more than 5 cm (29.7%).

In the present study Apgar score less than 7 at 1 minute and 5 minutes were more in meconium stained group compared to clear liquor. In our study 21.8% of newborn in the meconium group had Apgar score less than 7 at 5 minutes in 69% of newborn with meconium, which did not match with our study. Conflicting results may be due to increased incidence of caesarean section in early labour or better resuscitation of newborn at birth. In this study at 10 minutes after birth, 6.5% of newborn with meconium still had Apgar score less than 7 compared to 2.7% in the control group though mean Apgar score was almost same in both group.

Meconium aspiration syndrome (MAS) is a life-threatening complication in cases with meconium stained liquor and occurs in 5% of newborn with meconium (Cleary GM, 1998).¹⁸ Various authors have found various incidences of MAS. Patil Kamal et al (2006) found it in 19% of newborn with thick meconium and 2% in thin, with overall incidence of 12.8%.¹⁹ But R. Manganaro et al (2001) found it in 0.28% of cases.¹⁷ In our study it was 1% in moderately stained and 3% in thick meconium with overall incidence of 4%. Incidence of MAS was 2.7% when meconium was detected at cervical dilatation of less than 5 cm and it was 1.4% after 5 cm of cervical dilatation with no significant difference.

In present study, first week neonatal death was 0.5% in meconium stained group and 1% in the control group with no significant difference. Patil Kamal Pet al (2006) found perinatal mortality of 9.5% which is relatively high.¹⁹

Table 1: Comparison of Apgar score at 1 minute between meconium stained liquor and control

Group	Apgar score <7	Apgar score ≥7	Total
Meconium stained liquor	70 (37.8%)	115 (62.2%)	185
Clear liquor	312 (20.8%)	1183 (79.2%)	1495
Total	382	1298	1680

Table 2: Comparison of Apgar score at 5 minutes between meconium stained liquor and control

Group	Apgar score <7	Apgar score ≥7	Total
Meconium stained liquor	40 (21.6%)	145 (78.4%)	185
Clear liquor	95 (6.3%)	1400 (93.7%)	1495
Total	135	1545	1680

Table 3: Comparison of Apgar score at 10 minutes between meconium stained liquor and control

Group	Apgar score <7	Apgar score ≥7	Total
Meconium stained liquor	13 (7.1%)	172 (92.9%)	185
Clear liquor	42 (2.8%)	1453 (97.2%)	1495
Total	55	1625	1680

Table 4: Correlation of different grades of meconium staining and meconium aspiration syndrome (MAS)

Detection of meconium	Number of cases	Mean Apgar score at 1 minute	Meconium aspiration syndrome	1 st week neonatal death
Group 1	110	5.2	3	1
Group 2	75	7.8	1	0
Total	185		4	1

Table: Incidence of first week neonatal death in meconium stained liquor compared to control group

Group	Number of cases	1 st week neonatal death
Meconium stained liquor	185	1 (0.54%)
Control	1495	15 (1%)
Total	1680	16

CONCLUSION

The following conclusions can be drawn from our study –

1. Meconium stained liquor is a very common complication during labour and its incidence is 11.01% as per this study.
2. Meconium stained liquor was subdivided into three types such as thin, moderate and thick stained depending upon the colour and consistency of liquor. About 50.2% cases had thinly stained liquor, 25.9% had moderately stained liquor and 23.92% had thickly stained liquor.
3. No significant correlation was seen between meconium stained liquor and maternal age, but the incidence of staining of liquor was found to be higher with increase of gestational age i.e. 17.1% in 41-42 weeks.
4. There is increased incidence of meconium stained liquor in cases with low birth-weight babies.
5. Incidence of instrumental vaginal delivery and caesarean section is significantly increased when liquor is meconium stained during labour.
6. Perinatal morbidity is increased in cases with meconium stained liquor as evidenced by low Apgar score at 1 and 5 minutes.
7. Incidence of meconium aspiration syndrome was seen in 4 out of 185 cases, out of which 3 were seen in cases with thickly stained liquor.

In conclusion, it can be said that our study has revealed some results that further establishes some well-known facts about meconium stained liquor. On the other hand, it has shown one/two results that challenges usual knowledge. A multicentric randomized controlled trial is needed involving more patients to discuss about this pertinent issue, in order to plan for further change in existing treatment protocol for the management of meconium stained liquor cases.

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