

Assessment Of Meconium Stained Liquor Incidence In Postdated Pregnancies At A Multi-Speciality Maternity Hospital In India

Anupama Bhagat, Kashish Ayaz Khan

Abstract:

Objective: This study aimed to ascertain the prevalence of meconium-stained liquor (MSL) among women at or beyond the expected date of delivery within the Indian population.

Methods: A retrospective analysis of deliveries occurring after 40 weeks between March 2018 and February 2019 was conducted. Data were extracted from labor room registries.

Results: Among the 1000 deliveries at our institute during 2017-2018, 60 (6%) occurred after 40 weeks. MSL was observed in 9 (15%) of these cases. Notably, 87% of women with MSL underwent cesarean section, while 7% underwent instrumental delivery.

Conclusion: The prevalence of MSL rises with gestational age beyond 40 weeks. Cesarean section emerged as the predominant mode of delivery among pregnancies complicated by MSL. Further research may elucidate additional factors influencing MSL occurrence and delivery outcomes in postdated pregnancies.

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I. Introduction

Meconium staining in amniotic fluid serves as a pivotal factor influencing obstetric decision-making, traditionally indicating fetal distress. The presence of meconium-stained liquor (MSL) can heighten neonatal respiratory morbidity, notably through the development of meconium aspiration syndrome (MAS), an occurrence noted in approximately 1% of cases. Furthermore, MSL correlates with an increased risk of sepsis, neurological impairment, convulsions, and prolonged neonatal intensive care unit (NICU) admissions. Notably, the likelihood of encountering MSL escalates with advancing gestational age beyond 40 weeks.

MAS stands as a significant contributor to perinatal morbidity and mortality in pregnancies extended beyond term. The prevailing hypothesis suggests that intrauterine hypoxia triggers anal sphincter relaxation, leading to the passage of meconium. Physiologically, maturation of the fetal parasympathetic nervous system prompts sphincter relaxation and subsequent meconium passage. Research by Caughey AB et al. highlights a sixfold increase in amniotic fluid meconium levels among women at 42 weeks or beyond compared to those at 37 weeks. Additionally, their findings indicate an elevated risk of cesarean section and MSL occurrence beyond 41 weeks, underscoring prolonged pregnancy as a common indication for induction.

Postdated and post-term pregnancies, exceeding the expected delivery date and surpassing 42 weeks of gestation, respectively, account for approximately 7% of births in the United States. Observational studies identify primigravidity, prior post-term pregnancy, male fetus, obesity, and genetic predisposition as risk factors for prolonged gestation. Guidelines from the American College of Obstetrics and Gynaecology advocate for labor induction beyond 41 weeks, with consideration for induction beyond 42 weeks. Similarly, S-1 guidelines by Weiss et al. in Germany propose induction from 41 + 0 gestation, recommending induction by 41 + 3 gestation at the latest.

Ethnic disparities in MSL prevalence among term pregnancies contribute to varying rates of stillbirth and perinatal morbidity as pregnancies progress. Independent predictors of MSL include Black ethnicity (odds ratio 8.4, 95% CI 2.4 - 28.8) or South Asian ethnicity (OR 3.3, 95% CI 1.3-8.3). This emphasises the need for heightened antenatal surveillance beyond 40 weeks, particularly among Black and South Asian populations. Against this backdrop, our study endeavours to determine the prevalence of MSL in the Indian population beyond 40 weeks of gestation.

Objective: This study aims to assess the prevalence of meconium-stained liquor (MSL) among women in the Indian population at and beyond the expected date of delivery

II. Materials And Methods:

A retrospective analysis was conducted on deliveries occurring in a tertiary care hospital in Northern India, between March 2017 and February 2018. The study focused on women who delivered at or beyond 40

weeks of gestation and had confirmed last menstrual period (LMP) dates along with first-trimester dating ultrasound scans for gestational age determination. Cases with unknown LMP and lacking first-trimester ultrasound scans were excluded from the analysis. Data were retrieved from labor room registries.

Variables associated with the presence of meconium in amniotic fluid, such as gestational age at and beyond 40 weeks, mode of delivery (induced/spontaneous), pregnancy complications (hypothyroidism, hypertensive disorders, abruption, intrahepatic cholestasis of pregnancy, intrauterine growth retardation), major congenital malformations, and neonatal outcomes, were also assessed.

III. Results:

Out of 1000 deliveries in the labor room at our institute between 2018 and 2019, 61 (6%) occurred at or beyond 40 weeks gestation. The distribution of gestational ages among these 61 pregnancies is summarised in Table 1. Labor induction was performed in 26 (42.6%) of women with a gestational age of 40 weeks. Cesarean section was the mode of delivery in 29 out of 60 (48.3%) cases, with one case necessitating peripartum hysterectomy due to uterine rupture. Meconium-stained liquor was observed in 9 (14.8%) cases.

Among the women with meconium-stained liquor, 4 (44.4%) were induced either due to postdated pregnancy or other obstetrical indications. Factors such as intrauterine growth restriction, abruption, hypothyroidism, and cholestasis, known to be associated with meconium-stained liquor, were present in 4 out of 9 cases (44.4%), while absent in 5 out of 9 cases (55.6%). Cesarean section was the predominant mode of delivery among women with meconium-stained liquor, accounting for 87% of cases, while 1 out of 9 (11.1%) underwent instrumental delivery. Congenital malformations were detected in 16% of all babies delivered, with 5% classified as major malformations.

Of the 61 deliveries, 2 resulted in stillbirth (3.3%). Among these stillbirths, 50% were associated with major congenital malformations, 18% had obstetric causes, 6% were attributed to meconium-stained liquor (presumed cause: fetal distress), and 29% were intrauterine deaths upon admission. Among babies born with meconium-stained liquor, only 1 (11.1%) had a one-minute Apgar score below 6.

IV. Discussion:

The investigation revealed a prevalence of meconium-stained amniotic fluid in postdated pregnancies at our institution of approximately 14.92%. This corresponds with findings reported by Narasimhaiah A et al from a Delhi hospital (11.73%) and Addisiu et al in term pregnancies (17.8%). Similarly, Hirsch et al reported an overall prevalence of 12% in pregnancies at and beyond term, noting a positive association between meconium staining rates and gestational age progression. This underscores the inherent physiological nature of meconium staining, linked to fetal gastrointestinal tract maturity, while also highlighting its potential association with respiratory morbidity.

Despite observing an increase in meconium staining prevalence with advancing gestational age, our study did not identify a corresponding escalation in neonatal morbidity. This divergence may be attributed to prompt interventions such as cesarean or instrumental delivery. Factors contributing to meconium aspiration syndrome, including fetal distress, non-reassuring fetal status, fetal growth restriction, and post-maturity, were underscored by Mundhra and Aggarwal's investigation in Shillong, India. Their study illustrated heightened rates of cesarean delivery, neonatal admissions, birth asphyxia, and meconium aspiration syndrome in pregnancies beyond term with meconium-stained liquor.

In our study, induction was initiated in 42.8% of cases primarily due to postdated pregnancy, a finding consistent with Kassis et al's observations in Israel. They reported increased induction rates and meconium-stained liquor occurrences in postdated pregnancies, correlating with an augmented relative risk of fetal distress with advancing gestational age. Consequently, a heightened induction rate in postdated pregnancies seems justified.

The elevated incidence of cesarean section in pregnancies with meconium-stained liquor at our institution often stemmed from a poor Bishop's score upon admission, precluding the feasibility of a trial of induction. Additionally, decisions for cesarean section were influenced by non-reassuring cardiotocography features, especially in early labor, given the unavailability of fetal scalp blood monitoring.

Limitations inherent in our study include its retrospective design and a relatively modest sample size of postdates women. Future research, particularly prospective and multicentric studies with extended neonatal follow-up, would provide deeper insights into the likelihood of meconium passage at different gestational ages beyond term and associated neonatal morbidity and mortality risks. Given the heightened prevalence of meconium-stained liquor in fetuses after 40 weeks, prospective investigations are warranted to inform the formulation of Indian guidelines regarding early labor induction beyond 40 weeks gestation.

V. Conclusion:

Our study revealed a prevalence of meconium-stained liquor in Indian women beyond 40 weeks gestation of 14.92% at our institution. The prevalence escalates with advancing gestational age. Cesarean section

emerged as the predominant mode of delivery for most pregnancies complicated by meconium-stained liquor. Encouragingly, neonatal outcomes were favorable among babies born with meconium-stained liquor.

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