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# Incidence of meconium stained amniotic fluid in postdated pregnancy in tertiary health care, Government General hospital,Kadapa

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**ABSTRACT**

Objective: To determine the prevalence of meconium stained amniotic fluid in women beyond expected date of delivery in Indian population.

Methods: A prospective analysis of all women delivered at more than 40 weeks from January 2021 to December 2022 in GGH Kadapa was done.

Results: A total of 7,645 women delivered in the labor room at our institute during the year 2021-2022. Of these, 535(6.99%) were more than 40 weeks. Meconium stained amniotic fluid (MSAF) was present in 98 (18.31%). In our study, 88.7% of women with MSAF underwent a cesarean section while 5/98 (5.1%) had instrumental delivery.

Conclusion: Prevalence of meconium stained amniotic fluid (MSAF) increases with increasing gestational age after 40 weeks. Most of the pregnancies with eventually delivered via cesarean section.

Keywords: Meconium, postdated pregnancy, meconium aspiration syndrome, induction, fetal distress.

**INTRODUCTION**

Meconium-stained amniotic fluid (MSAF) is a potentially serious sign of foetal compromise, and it is associated with increased perinatal mortality and morbidities(1). MSAF occurs in 5 to 20% of pregnancies, especially in term and post-term(2). Some factors associated with it are placental insufficiency, maternal hypertension, pre-eclampsia, oligohydramnios, or maternal drug abuse(3).

Meconium, the gastrointestinal excreta of foetus is derived from Greek “mekonion” meaning “from poppy” or “like opium” and believed that the substance caused sleeping state of the foetus in the mother’s womb. Some theories have been proposed to explain foetal passage of meconium. Foetus passes meconium in response to hypoxia and signals foetal compromise (4). In utero passage of meconium may represent normal gastrointestinal tract maturation under neural control. Meconium passage could follow vagal stimulation from common but transient umbilical cord entrapment and resultant increased peristalsis. Thus meconium release also could represent physiological process (5). 7-22% of pregnancy has been complicated due to meconium passage (6). 5% of these develop meconium aspiration syndrome. Meconium aspiration syndrome can cause or contribute to neonatal death in up to 0.05% (i.e. 1 in 2000 of all pregnancies) (7). Meconium passage is rare before 32 weeks and its incidence increases as gestational age increases, especially in postdated pregnancy(8). Factors such as placental insufficiency, maternal hypertension, preeclampsia, oligohydramnios, postdatism, diabetes or maternal drug abuse (tobacco, Cocaine) result in inutero passage of meconium(9). Meconium stained liquor is associated with higher rate of caesarean delivery, instrumental delivery, NICU admission rate, fetal distress, low birth

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weight, neonatal death (10). Various measures have been done to prevent these complications like amnioinfusion, oropharyngeal suctioning, endotracheal intubation after birth etc. (11). There is controversary regarding its outcome and management, so this present clinical study was done to find out its significance in respect of perinatal mortality and morbidity.

Postdated pregnancy is the one which has crossed expected date of delivery. Post term pregnancy is the one that has completed or gone beyond 42 weeks of gestation( 12) . The prevalence of late term and post term births in United States is around 7% (13) . A number of observational studies have identified risk factors for prolonged pregnancy to include primigravidity, prior post-term pregnancy, male fetus, obesity and genetic predisposition(14) . American College of Obstetrics and Gynecology recommends that, women beyond 41 weeks should be offered induction of labour and beyond 42 weeks should be considered for induction(12) . S-1 guidelines by Weiss et al in Germany recommend offering pregnant women the option of inducing labor from 41 + 0 gestation and state that induction of labor must be recommended by 41 + 3 gestation at the latest (15) . There is evidence of ethnic variations in meconium stained amniotic fluid in term pregnancies. This leads to different rates of stillbirth and perinatal morbidity as the pregnancy approaches late term and beyond. Independent predictors of meconium stained amniotic fluid includes being Black (odds ratio 8.4, 95% CI 2.4 - 28.8) or South Asian (OR 3.3, 95% CI 1.3-8.3) (16) . Fetuses of Black and Indian races can pass meconium early and consequently can cause fetal distress. This urged us to hypothesize that in Asians and Blacks, fetus attains maturity earlier. The significance is that physicians should increase antenatal surveillance beyond 40 weeks. With this background we aim to find out the prevalence of MSL in Indian population beyond 40 weeks.

## Materials and methods

A retrospective analysis of all women delivered at more than 40 weeks from January 2021 to December 2022 in RIMS Kadapa was done. All those women who were sure of her last menstrual period (LMP) and had first trimester dating ultrasound scan were included. The cases where LMP was not known and no first trimester USG was available to ascertain the gestational age were excluded. Data were collected from labour room registries. Other variables associated with the presence of meconium in amniotic fluid like period of gestation at and beyond 40 weeks, induced/spontaneous labor, complications in pregnancy (hypothyroidism, hypertensive disorders, abruption, intrahepatic cholestasis of pregnancy, intrauterine growth retardation), major congenital malformations, mode of delivery and neonatal outcome were also evaluated.

## Results

A total of 7,645 women delivered in the labor room at our institute during the year 2021-2022. Of these, 535(6.99%) were more than 40 weeks. The distribution of gestational age of these 535 pregnancies at or beyond 40 weeks is shown in table 1. Labor was induced in 253(47.28%) of these women with gestational age of 40 weeks. The mode of delivery was cesarean section in 153/253(60.47%) of all women. One had peripartum hysterectomy for uterine rupture. Meconium stained liquor was present in 98/535 (18.31%). Factors like intrauterine growth restriction, abruption, hypothyroidism and cholestasis that are associated with MSL were present in 35/98(35.71%) while in 63/98 (64.28%) they were not. In our study, 94.89% of women with MSL underwent a cesarean section and 5/98 (5.1%) had

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instrumental delivery. Congenital malformations were present in 17.9% of all babies delivered. Out of 535 deliveries, 17 ended up in stillbirth (3.17%). Out of the 17 stillborn, 47% had major congenital malformation, 17.64% had obstetric cause associated, 5.80% presented with MSL (the probable cause was fetal distress) and 29.41 % were intrauterine deaths on admission. Amongst all the babies born with MSL, only one (0.93%) baby had one minute Apgar score < 6.

| Gestational Age in weeks | Pregnancies in number | Pregnancies with MSL | Prevalence of MSL (%) |
|---|---|---|---|
| 40-41 | 426 | 65 | 15.2 |
| 41-42 | 92 | 37 | 40.21 |
| 42-43 | 17 | 5 | 29.41 |

## Discussion

Prevalence of meconium stained amniotic fluid in postdated pregnancies in our institute is 18.3 %. According to a study done by Narasimhaiah A et al in a hospital in Delhi, the incidence of MSL in postdated pregnancies was 11.73% (17) while Addisiu et al (18) reported a prevalence of MSL of 17.8% in term pregnancies. According to Hiersch et al (19), the overall prevalence of meconium stained amniotic fluid was 12% in pregnancies at and beyond term. A positive relation was observed between the rates of meconium staining and advancing gestational age. This reinforces the theory that meconium staining of liquor is a physiological event and is linked to maturity of fetal gastrointestinal tract. But still, presence of meconium is a risk factor for respiratory morbidity. The highest odds for respiratory morbidity were found to be in late term gestation when pregnancies with clear liquor were compared with meconium stained liquor. They also found that the effect of meconium stained liquor and increased respiratory morbidity is most significant at 41 weeks of gestation.

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In our study, most of the babies of women with MSL had Apgar score of >7 at 1minute and 5 minutes. Although the prevalence of meconium stained liquor increased as the gestation advanced, but neonatal morbidity was not increased. This may be related to early intervention in the form of cesarean or instrumental delivery. Fetal distress, non-reassuring fetal status, fetal growth restriction and post maturity are the factors which can lead to meconium aspiration syndrome (20). A prospective observational study carried out in Shillong, India by Mundhra and Aggarwal (8) pointed out the worrisome complications of meconium in amniotic fluid in gestations beyond term. They included 165 cases of term pregnancies with meconium stained liquor and compared with 190 controls. Fifty percent cases were of more than 40 weeks of gestation. Cesarean rate was found to be double to that of control population with clear liquor (81% vs. 49%). There was increased rate of neonatal admissions, birth asphyxia and meconium aspiration syndrome. Post term pregnancies have been associated with varied complications like increased frequency of neonatal convulsions, meconium aspiration syndrome and Apgar score of less than 4 at 5 minutes (21).

In our study also, cesarean rate was found to be very high in pregnancies with MSL, however neonatal morbidity was not seen. In our study, 47.28% women were induced mainly for postdated pregnancy. In a study by Kassis et al (21) done in Israel, postdated pregnancies had higher rate of induction ( 40% vs. 3%) and meconium stained liquor (31 vs 15.5%). The relative risk of fetal distress in the form of non-reassuring cardiotocography in women with meconium stained liquor increased with more advanced gestational age 16. Hence, there is a higher rate of induction in postdated pregnancies. In our institute, incidence of cesarean section is high in pregnancies with MSL. The most common reason is a poor bishop's score at admission, which leads to a decision of not giving a trial of induction. In our institute in the absence of provision of fetal scalp blood monitoring, non-reassuring features in cardiotocograph are considered as an indication of cesarean section in these pregnancies, especially if discovered in early labor.

This was a retrospective study with a relatively small sample of postdates women. Prevalence of MSL in term pregnancies before 40 weeks and its comparison with those beyond 40 weeks is not included in this study. A prospective multicentric study with longer follow up of the neonate would further elucidate the chances of meconium passage at different gestations beyond term and the odds of neonatal morbidity and mortality. Since prevalence of MSL is high in our fetuses after 40 weeks and increases with increasing gestational age, prospective studies should be done to make Indian guidelines for early induction of labour after 40 weeks.

## Conclusion

The prevalence of meconium stained liquor in Indian women at more than 40 weeks was 18.3% at our institute. Prevalence increases with increasing gestational age. Most of the pregnancies with MSL eventually delivered via cesarean section. Neonatal outcome is favourable in babies born with MSL.

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