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Meconium Stained Liquor at Term and Its Obstetrical and Perinatal Outcome

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Abstract

Obstetrical teaching throughout this century has included the concept that meconium passage is a potential warning of fetal asphyxia. An association among meconium stained liquor, fetal compromise and perinatal morbidity is well known. *Objective:* The present prospective study is to know the prevalence of meconium at term, the mode of delivery and perinatal outcome in our hospital. *Methods:* A prospective study conducted over 6 months in Department of Obstetrics and Gynecology, ESIMC PGI MSR Bangalore, Karnataka. Data collected from all labouring women with meconium stained liquor on either spontaneous or artificial rupture of membranes, were enrolled for the study after obtaining written and informed consent. *Result:* In our study out of 1680 delivered women 118 women were with MSAF , with prevalence of 7% of MSAF . 36 women Delivered by FTVD with prevalence of 30%, 82 women by LSCS with prevalence of 70% . With NICU admission for MAS is 15%. *Conclusion*: Meconium stained amniotic fluid during labour & delivery is associated with increased caesarean section. So the outcome of meconium stained amniotic fluid during labour & delivery is unpredictable .

Keywords: Meconium Stained Amniotic Fluid; Meconium Aspiration Syndrome; Thick Meconium.

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Introduction

Meconium is sterile intestinal discharge of new born, a viscous dark green substance composed of intestinal epithelial cells, lanugo, mucus, biles, mucosal cells & solid elements of swallowed Amniotic fluid.

In the past, meconium stained liquor was considered as a sign of fetal distress. It is now recognized that in the majority of cases meconium passage is a manifestation of a maturing gastrointestinal tract or is the result of vagal stimulation due to umbilical cord compression. Intestinal meconium appears very early in gestation meconium stained amniotic fluid rarely occurs before 38 weeks gestational age .

An association among meconium stained liquor, fetal compromise and perinatal morbidity is well known . However, most of the infants with meconium in liquor do not have low APGAR, more acidosis or clinical illness than infants born with clear amniotic fluid. The neonatal outcome in meconium stained liquor is generally comparable to deliveries with clear amniotic fluid, when the fetal heart rate is normal. Perinatal morbidity is increased in newborns with abnormal fetal heart rate. Hence the presence of meconium in liquor calls for continuous fetal heart rate monitoring / fetal blood sampling [1,2].

Meconium is rarely found in prior to 34 wks. The presence of meconium stained amniotic fluid is a sign of foetal compromise, which is associated with an increase in prenatal morbidity [3,4] clear amniotic fluid on the other hand is considered reassuring. The exact etiology of MSAF remains unclear [5,6].

Risk factors that may cause stress on the fetus which lead to MSAF are: placental

ageing due to postdated pregnancy, Iugr, oligohydramnios, hypertensive disorder of pregnancy, GDM, overt diabetes melitus, maternal chronic respiratory or cardiovascular diseases , poor biophysical profile, preeclampsia, eclampsia & maternal drug abuse .

Aspiration of meconium during intrauterine life may lead to meconium aspiration syndrome (MAS), a leading cause of perinatal death [7]. MAS is more frequently seen in post term pregnancy or in growth restricted foetuses. Factors such as placental insufficiency, maternal hypertension, pre eclampsia, oligohydroamnios or maternal drug abuse (tobacco or cocaine) result in, inuteropassage of meconium. Meconium stained liquor may beaspirated during delivery resulting in Neonatal respiratory distress syndrome [8]. The incidence of admission to newborn intensive care unit with, respiratory distress syndrome, meconium aspiration syndrome [9], neonatal asphyxia [10], chorioamnionitis [11], foetal distress or foetal acidosis [12] were higher in pregnancies complicated by meconium stained liquor. MSAF occurs in 10% of pregnancies with most occurring at term or particularly post term. Caesarean sections were performed twice as frequently in women presenting with MSAF and failure to progress, which was the indication in more than half of the cases.

The fetus passes meconium into the amniotic fluid in 10%of all pregnancies, in 5% of these (1:200 of all pregnancies) the meconium is aspirated into the lungs of the fetus or the neonate [13]. This can result in severe respiratory distress, meconium aspiration syndrome .

Methods

This is a hospital based observational study. The study was conducted in the Institute of Obstetrics and Gynecology ESIC PGIMSR BANGALORE for over period of 6 months .

From The labouring women with MSAF on spontaneous or artifical rupture of membranes is selected to kmow the mode of delivery and perinatal outcome.

Out of 1680 deliveries, 118 patients had meconium stained liquor. All the patients in the study undergone a standardised form of labour management. The patients who fulfilled the inclusion criteria were enrolled in the study. Patients detailed history, gestational age, per abdominal examination, per speculum and per vaginal examination, admission tests including intrapartum CTG were recorded in a pre designed proforma. The patients were carefully monitored for the progress of the labour by plotting the parameters on a partogram. The fetal heart rate was strictly monitored by continuous electronic fetal monitoring. The fetal heart rate tracing were classified as normal, suspicious, abnormal according the NICE (National Institute of Clinical Exellence) guidelines [14] .

Inclusion Criteria

The inclusion criteria are gestational age >37 weeks, cephalic presentation, singleton pregnancy in patients with meconium stained liquor (grade I, II, III) after spontaneous or artificial rupture of membranes during labour.

Exclusion Criteria

The exclusion criteria are gestational age <37 weeks, previous cesarean section, multiple pregnancy, non cephalic presentations, like breech transverse lie and compound presentation.

Result

Table 1:

Primi	72(61%)
Multi	46(39%)

Depicts majority of women are Primi (n=72) with 61% and multi are 46% (n=39) .

Table 2:

FTND	36 (30%)
LSCS	82 (70%)

Depicts rate of FTND is 30% (n=36) and rate if LSCS is 70%(n=82).

Discussion

Meconium stained amniotic fluid is a commonly observed phenomenon. Although the exact cause is not known, meconium is thought to be passed from the fetal gastro-intestinal tract as a response to hypoxia, mesentric vasoconstriction induced gut hyperperistalsis, falling umbilical venous saturation, vagal stimulation and normal physiological function of a mature fetus [15,16].

Neuronal vagal stimulation of maturing GI tract due to fetal hypoxia cause peristalsis & relaxation of the rectal sphincter leading to meconium passage.

Reduces antibacterial activity & increases perinatal bacterial infection .

Aspiration of meconium induces hypoxia via fourpulmonary effect i.e airway obstruction,surfactant dysfunction, chemical pneumonitis & primary pulmonary hypertension.meconium deactivates surfactant & may also inhibit surfactant synthesis [9]. Freefattyacids of meconium have higher minimal surface tension than surfactant & strip it from the alveolar surface result diffuse atelectasis [17].

MSAF can be graded as —

Grade I (Thin): Slight greenish or yellowish tinge discolouration.

Grade II (Moderate): AF looks like khakhi green or brownish in colour.

Grade III (Thick): AF are very dark green colour and pea soup in consistency.

Meconium aspiration is a common neonatal problem associated with meconium stained amniotic fluid. Aspiration can occur with fetal gasping or after birth with first breaths of life. Meconium aspiration can lead to increased perinatal morbidity and mortality despite the fact that meconium is sterile and the majority of infants born with MSAF show no long term impairments [18] .

Meconium aspiration syndrome was significantly higher in the thick meconium group compared to thin meconium i.e. 90% of the cases of meconium aspiration syndrome were associated with thick meconium compared to 10% of the cases with thin meconium. Thus consistency of the meconium is an important factor in the development of MAS. Fetal heart rate abnormalities either in the form of fetal bradycardia or tachycardia was observed in 100 cases of thick meconium and 10 cases of thin meconium, which was statistically significant. Thus thick meconium is more often associated with fetal hypoxia than thin meconium. The "thickness" of meconium had a direct bearing on the neonatal outcome. Incidence of birth asphyxia was significantly higher in thick meconium compared to thin meconium. There was no mortality in thin MSAF with birth asphyxia group. All cases of MAS were seen only in the thick meconium group as has been observed by many other workers [19].

Presence of meconium in absence of fetal heart rate abnormalities is not suggestive of fetal compromise and does not require any intervention [20]. The increased rate of emergency Caesarean Section, Instrumental Vaginal Delivery for fetal distress, meconium aspiration syndrome and neuro developmental handicaps are possible problems with MSAF [21]. The presence of thick meconium is associated with increased incidence of perinatal morbidity and mortality. Prolonged labour is also a risk factor for the passage of meconium . Prolonged labour is also a risk factor for the passage of meconium as proved by Saunder et al [22] who showed that prolonged labour is associated with worst outcome in MSAF group. After the initial hypoxic bout initiating the passage of meconium, subsequent repetitive bouts due to prolonged labour or abnormal uterine activity may cause severe asphyxia [23]. Prevention of MSA can be achieved by avoiding post maturity, as decreased term of gestation reduces perinatal mortality.

In our study labouring women with meconium is 118 with prevalence of 7 % which correlates with study of Narang et al Management of meconium stained amniotic fluid which is 7.4% [24] and K Supriya et al Clinical study of meconium stained amniotic fluid is 6.1% [25] .

In our study rate of lscs is 70% which correlates with A K Mahapatro Obstetrics outcome at term in meconium stained amniotic fluid which is 84% [26] also with Patit et al [27] and Naveen et al [28] which is 42%and 49% respectively .

Delivery by vaginal route is 30% which correlates with Narang et al 30% .

In our study NICU admission is 15% with MAS 22% and One neonatal death due to MAS and Primary pulmonary hypertension syndrome which is 5.5% , consistent with 10.5% reported by Narang et al , while Bhide et al (29) have reported an incidence of 22% and Gregory et al of 20%(30).

Conclusion

Meconium stained amniotic fluid during labour & delivery is associated with increased caesarean section . So the outcome of meconium stained amniotic fluid during labour & delivery is unpredictable. MSAF is also associated with neonatal morbidity which concludes early decision is important to prevent perinatal morbidity and mortality .

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