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RESEARCH ARTICLE

PERINATAL OUTCOME IN MECONIUM STAINED AMNIOTIC FLUID A PROSPECTIVE STUDY

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ABSTRACT

Aims & Objectives: To determine the perinatal outcome in meconium stained amniotic fluid.
Material & Methods: This prospective study was conducted from January 2013 to March 2014 on patients admitted to Labour ward, of RMC, Ajmer.
Out of 16546 deliveries 2295 cases, 200 patients who met the inclusion criteria were enrolled in our study.
Results: In current study incidence of meconium staining of amniotic fluid (MSAF) is 13.87% In thin MSAF 37.5% and thick MSAF 52.5%, PMR 5.5 % and morbidity 20.5% in which 4.5% and 16.5% respectively in thick and thin.
Conclusion: Immediate airway management, need for suction and incubation should be guided by state of newborn rather than presence of meconium timely diagnosis and management MSAF may improve fetal outcome from our study conclude that MSAF adversely affect fetal outcome mostly by thick meconium.

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INTRODUCTION

Meconium staining of the amniotic fluid has long been regarded as a sign of fetal distress. Although the exact cause is not known meconium is thought to be passed from the fetal gastro-intestinal tract as a response to hypoxia, mesenteric vasoconstriction induced gut hyperperistalsis, falling umbilical venous saturation, vagal stimulation and normal physiological function of a mature fetus. (Walker, 1959; Fenton and Steer, 1962) Conflicting outcomes have been reported in the labours, complicated by meconium stating of the amniotic fluid, varying with the degree of meconium staining. (Low *et al*., 1975; Meis *et al*., 1978; Abramovici *et al*., 1974) Foetal distress is defined as alterations in the foetal heart rate (FHR) more commonly bradycardia and the passage of meconium in response to the underlying foetal hypoxia. Variations in FHR, passage of the meconium in the amniotic fluid, pathological or abnormal CTG and decreased foetal scalp blood pH are strong indicators of fetal distress. (Wong *et al*., 2002) MSAF is associated with higher rate of caesarean delivery, increased need for neonatal resuscitation and meconium aspiration syndrome. (Shaikh *et al*., 2010) The risk factors for meconium stained amniotic fluid are both maternal and fetal. The maternal factors are hypertension, Gestational Diabetes Mellitus, maternal chronic respiratory or cardiovascular diseases, post term pregnancy, preeclampsia, eclampsia.

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The fetal factors include oligohydramnios, intrauterine growth restriction, poor biophysical profile. (Hackey, 1999) Aspiration of meconium by the fetus remains relatively common cause of perinatal morbidity and mortality because it is difficult to prevent. (Ashfaq and Shah, 2004)

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. (Ashfaq and Shah, 2004) This can result in severe respiratory distress, meconium aspiration syndrome. (Ashfaq and Shah, 2004) Thick meconium by itself is not associated with adverse fetal outcome. However, the incidence of meconium aspiration syndrome increases in case of non-reassuring FHR and clinical condition of the newborn at birth. (Paz *et al*., 2001; Bhutta and Jalil, 1992) The meconium aspiration syndrome can cause or contribute to neonatal death and in addition upto one-third of all cases in which aspiration occurs, develop long term respiratory compromise. (Steer *et al*., 2006) The meconium stained amniotic fluid is a clinical diagnosis with no practical confirmatory test. (Tybulweicz *et al*., 2004)

However, various methods have been tried to detect the presence of meconium in liquor and to prevent meconium aspiration syndrome. These methods include Amnioscopy during early labour and oropharyngeal suction and endotracheal intubation after birth. The perinatal morbidity and

mortality associated with meconium aspiration syndrome can be brought down if the high risks are identified in the antenatal period and careful decisions are made about the timing and mode of delivery and vigilant monitoring of the labour. This study was carried out to determine foetal outcome and mode of delivery in pregnant women with meconium stained liquor.

Aims and Objectives

To determine the perinatal outcome and mode of delivery in patients with meconium stained liquor during labour.

Inclusion and Exclusion criteria

The inclusion criteria are gestational age >37 weeks, cephalic presentation, singleton pregnancy in patients with meconium stained liquor (Thick & Thin) after spontaneous or artificial rupture of membranes during labour. The exclusion criteria are gestational age < 37 weeks, previous cesarean section, multiple pregnancy, malpresentation, fetal malformation, IUD, eclampsia, APH.

MATERIALS AND METHODS

After obtaining ethical clearance this prospective study was conducted from January 2013 to March 2014. The study was done on patients admitted to labour ward, in the Department of Obstetrics and Gynecology at Rajkiya Mahilya Chikitsalaya, Ajmer. Pregnant women with singleton pregnancy, cephalic presentation with more than 37 weeks of gestational age were studied. Out of 2295 deliveries, 200 cases had meconium stained amniotic fluid. The patients who fulfilled the inclusion criteria were enrolled in the study. 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 meconium staining of the amniotic fluid was classified as thin meconium stained liquor is translucent, light yellow green in colour, thick is opalescent with deep green and yellow in colour. Delivery is expedited when fetal heart rate abnormalities were detected by safest mode of delivery either by instrumental vaginal delivery or caesarean section. All patients underwent full trial of labour and caesarean section was done only if trial of labour was unsuccessful or if there were obstetric indications including fetal distress. The APGAR score of neonates at 1 & 5 minutes, birth weight, NICU admission, the neonates who had meconium aspiration syndrome and birth asphyxia were recorded.

RESULTS AND OBSERVATIONS

Table 1. Distribution of meconium stained liquor deliveries

Total number of deliveries	Meconium Stained Liquor Deliveries n=200 (13.87%)	
2295	Thick MSAF 125(62.5%)	Thin MSAF 75 (37.5%)

Table 2. Potential risk factors for meconium stained liquor

Antepartum Risk Factors	Intrapartum Risk Factors
Pregnancy Induced Hypertension-33	Prolonged PROM – 20
Previous LSCS	Prolonged Labour – 6

Table 3. Birth weight & grade of meconium stained liquor

Grade of MSAF	<2.5 Kgs	>2.5 Kgs
THIN	9 (12%)	66 (88%)
THICK	18 (14.40%)	107 (85.6%)
Total	27	86

Table 4. Neonatal outcome according to grades of meconium stained liquor

Grade of Meconium Stained Liquor	Asymptomatic Routine Care a Birth	NICU Admission	Sepsis	MAS	Birth Asphyxia
THIN	56	19 (25.3%)	2	0	6
THICK	63	62 (49.61%)	3	11	15
Total	119 (59.5%)	81 (40.5%)	5 (2.5%)	14 (5.50%)	21 (10.5%)

Table 5. Mode of delivery & grades of meconium stained liquor

Grades of MSL	Normal Delivery	Instrumental Delivery	LSCS	Total
THIN	34 (45.33%)	13 (17.34%)	28 (37.33%)	75
THICK	36 (28.8%)	17 (13.60%)	72 (57.60%)	125
Total	70 (35%)	58 (23.2%)	106 (42.4%)	200

DISCUSSION

Meconium passage prior to birth occurs in upto 15% of term deliveries, meaning that frequency of MSAF very common. The detection of MSL during labour often causes apprehension and anxiety for the patient as well as the obstetrician as it is often considered as indication of fetal distress. (Naqvi and Manzor, 2011) Generally thick meconium is associated with poor perinatal outcomes. (Rossi *et al*., 1989; Arrow Naranga *et al*., 2003) Acute or chronic fetal hypoxia can result in the passage of meconium in utero. (Stark *et al*., 2003) This study showed that a majority of cases with MSAF was higher in age group of 20-30 years incidence of MSAF increase with gestational age and this was very evident in this study 60% had 39-40 weeks and mean gestational age in this study is 39.2 weeks. The MSAF and its association are still very important determinants of perinatal morbidity and mortality and a successful management of such pregnancies is only possible after better understanding pathophysiology of meconium passage (Sinsck *et al*., 2008) in this study 60% infants asymptomatic at birth, 20% have low apgar score, 5.5% had MAS and 10.5% birth asphyxia NICU admission of 40% perinatal detah in thin MSAF-1 out of 75 and in thick MSAF are 10 out of 125. Presence of meconium below vocal cord is known as meconium aspiration and occurs in 5.5 of all infants with MSAF.

MSAF alone is not an indication for caesarean section, however with MSAF needs strict supervision during labour for better perinatal outcome. In our study caesarean section rate of 50%, normal vaginal del. 35% instrumental delivery 15%. The low apgar scores may be because of direct vasoconstrictor effect of meconium on umbilical vein that results in vasospasm in leading to impaired placental blood flow. Infants with APGAR score < 7 at 5 min are three times more likely to have abnormalities on neurological examination. Presence of meconium in absence of fetal heart rate abnormalities is not

suggestive of fetal compromise and does not require any intervention. (Miller, 1975) 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. (Maymon *et al*., 1988)

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. (Fujikureat *et al*., 1975) Such repetive bouts can be avoided by careful fetal monitoring, active management of labour and optimal care after birth. This would help avoid unnecessary caesarian sections in all cases of meconium stained liquor in absence of a definitive indication. The clinical diagnosis of perinatal asphyxia is based on several criteria, the two main ones being evidence of cardiorespiratory and neurological depression (Defined as an APGAR Score remaining <7 at 5 min after birth) and evidence of acute hypoxic compromise with academic. (William McGuire *et al*., 2007). In our study, the total number of deliveries was 2295, among which there were 200 (13.87%) patients with meconium stained amniotic fluid. Thin (75) 37.5% and thick (125) (62.5%) debas AK, in her study, showed that there were 78.75% in thin and 21.25 in thick.

In our study, out of 200 MSAF deliveries, the potential antepartum risk factors for meconium stained liquor were PIH (33), anaemia (23) previcious LSCS (21). The intrapartum risk factors were prolonged PROM (20), prolonged labour (6) Kamal *et al*, in his study, the risk factors for MSAF, PROM (16%), PIH (8.66%), anaemia (6), NPOL (22) thick MSAF (30) (24%) babies. In contrast to our study, Miller *et al*. in her study, there were in thin (11.3%) in thick (19%) at 5 minute APGAR. In our study 81 babies needed NICU admission, in which 111 babies developed meconium aspiration syndrome and 21 babies had severe birth asphyxia, sepsis (5), pneumonitis (4), Praveen Goud *et al*. in his study, in thick (54.90%) thin (10.80%). In our study there were 27 (26.4%) babies with birth weight <2.5kg among which thin MSAF-9(12%). In thick MSAF-18(14.42%). In contrast to our study, Nayak *et al*. in his study, observed birth weight <2.5kg in thin (32.4%) thick (27.48%). In our study, there were 70 (35%) vaginal deliveries, 30 (15%) instrumental vaginal delivery and 100 (50%) caesarean section. The total number of vaginal deliveries including instrumental vaginal deliveries were 100 (50%). The caesarean section rate is higher among thick MSAF compared to thin, in our study. Bhide *et al*. in his study, showed the caesarean rate as 51.71%.

Conclusion

MSAF is really worrisome from obstetrician's and pediatrician's point of view, as it increase the caesarean rates causes birth asphyxia, MAS, increase NICU admission, which were clearly seen in this study presence of MSAF requires intensive fetal monitor in so as to decrease perinatal morbidity and mortality.

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