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Neonatal outcome in patients with meconium stained liquor in a rural tertiary care hospital: A prospective observational study

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Abstract
Introduction: The word meconium is derived from Greek word "meconium arion" which means like opium or poppy like substances causing sleeping like state of the fetus in mother's womb. Meconium staining of the amniotic fluid has long been regarded as a sign of fetal distress. Fetal distress has been defined as alteration in the fetal heart rate (FHR) more commonly bradycardia and the passage of meconium in response to the underlying fetal hypoxia. Variations in FHR, passage of meconium in the amniotic fluid, pathological or abnormal CTG and decreased fetal scalp blood PH are strong indicators of fetal distress. As meconium stained amniotic fluid is associated with lots of adverse outcome of fetus and has long been considered to be a bad predictor of fetal outcome so this observational study was undertaken to find out the correlation between pregnancy and immediate fetal outcome in meconium stained liquor to see the babies needed for immediate resuscitation and improve the fetal outcome in form of perinatal morbidity and mortality.
Aims and Objectives: To determine the fetal outcome in patients with meconium stained liquor during labour.
Materials and Methods: A prospective observational study was conducted in Obstetrics and Gynaecology department of our institution from January 2019 to June 2019 and study population included cases of meconium stained liquor during labor and their fetal outcome.
The inclusion criteria were women in labor with- term pregnancy (>37 weeks gestation), cephalic presentation, live singleton normal pregnancy. Exclusion criteria were- pregnant women in labour with not knowing last menstrual date, eclampsia, antepartum hemorrhage, intrauterine fetal death, congenital malformation, pre-existing maternal heart or lung disease, presentations other than cephalic.
Results: The results of fetal outcome was analysed statistically using SPSS version 19. The Chi Square test was applied between Grades of Meconium and APGAR Score. P-value< 0.05 which was statistically significant.
Conclusion: Meconium stained liquor alone is not assosiated with an adverse neonatal outcome, 86% of babies remained asymptomatic. Increasing grade of MSL is associated with increased adverse outcome.

Keywords: APGAR score, meconium aspiration syndrome, meconium stained liquor

Introduction
The word meconium is derived from Greek word "meconium arion" which means like opium or poppy like substances causing sleeping like state of the fetus in mother's womb. 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 mature fetus [1, 2].

Conflicting fetal outcomes have been reported, complicated by meconium staining of the amniotic fluid varying with the degree of meconium staining [3-5].

Fetal distress has been defined as alteration in the fetal heart rate (FHR) more commonly bradycardia and the passage of meconium in response to the underlying fetal hypoxia. Variations in FHR, passage of meconium in the amniotic fluid, pathological or abnormal CTG and decreased fetal scalp blood PH are strong indicators of fetal distress [6].

The risk factors for meconium stained amniotic fluid are both maternal and fetal. Maternal factors are hypertension, gestational diabetes mellitus, maternal chronic respiratory or

cardiovascular diseases, post term pregnancy, pre-eclampsia and eclampsia. The fetal factors include oligohydramnios, intrauterine growth restriction and poor biophysical profile [7].

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 [8]. This can result in severe respiratory distress, meconium aspiration syndrome [8]. 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 [9, 10]. 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 [11]. The meconium stained amniotic fluid is a clinical diagnosis with no practical confirmatory test [12].

As meconium stained amniotic fluid is associated with lots of adverse outcome of fetus and has long been considered to be a bad predictor of fetal outcome so this observational study was undertaken to find out the correlation between pregnancy and immediate fetal outcome in meconium stained liquor to see the babies needed for immediate resuscitation and improve the fetal outcome in form of perinatal morbidity and mortality.

Aims and Objectives

To determine the fetal outcome in patients with meconium stained liquor during labour.

Materials and Methods

A prospective observational study was conducted in Obstetrics and Gynaecology department of our institution from January 2019 to June 2019 and study population included cases of meconium stained liquor during labor and their fetal outcome.

The inclusion criteria were women in labor with- term pregnancy (>37 weeks gestation), cephalic presentation, live singleton normal pregnancy.

Exclusion criteria were-pregnant women in labour with not knowing last menstrual date, eclampsia, antepartum hemorrhage, intrauterine fetal death, congenital malformation, pre-existing maternal heart or lung disease, presentations other than cephalic.

Out of 4210 deliveries, 750 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. 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]. The meconium staining of the amniotic fluid was classified as Grade I, II, III. By visual examination after spontaneous or artificial rupture of membranes. Grade I meconium stained liquor is translucent, light yellow green in colour, grade II MSL is opalescent with deep green and light yellow in colour. Grade III is opaque and deep green in color. 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 caesarian 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 5 minutes, birth weight, NICU admission, the neonates who had meconium aspiration syndrome and birth asphyxia were recorded.

Results

Table 1: Distribution of meconium stained liquor deliveries

Total number of deliveries	Meconium stained liquor deliveries n= 750		
4210	Grade 1 MSL	Grade 2 MSL	Grade 3 MSL
	220 (29.3%)	345 (46%)	185(24.7%)

Table 2: Potential risk factors for meconium stained liquor

Antepartum risk factors	Intrapartum risk factors
Post dated pregnancy- 210	Prolonged PROM- 44
Pregnancy induced hypertension- 165	IUGR- 20
Oligohydramnios- 122	Prolonged labour- 11
Rh isoimmunisation- 45	
High maternal age(>35 years)- 21	

Table 3: Fetal outcome according to grades of meconium stained liquor and APGAR scores

Grades of MSL	<7	>7	Total
1	20(10.81%)	165(89.18%)	185
2	26(5.80%)	422(94.19%)	448
3	42(35.89%)	75(64.10%)	117
Total	88(11.73%)	662(88.27%)	750

Table 4: Birth weight and grade of meconium stained liquor

Grade of MSL	<2.5 kg	>2.5 kg
1	82(29.71%)	172(36.28%)
2	118(42.75%)	215(45.35%)
3	76(27.51)	87(18.33%)
Total	276(36.8%)	474(63.2%)

Table 5: Neonatal outcome according to grades of meconium stained liquor

Grades of meconium stained liquor	n= 750		n = 125		
	Asymptomatic routine care at birth	NICU admission	Ventilator	MAS	Birth asphyxia
1	228	20	7	6	5
2	310	31	21	14	6
3	87	74	30	18	18
Total	625(83.3%)	125 (16.7%)	58(46.4%)	38(30.4%)	29(23.1%)

Discussion

Fetal condition during labour is usually assessed by fetal heart rate and checking the presence of meconium in the amniotic fluid [13, 14]. The passage of meconium may be a normal physiological event reflecting fetal maturity. It may on the other hand reflect fetal hypoxia or increased vagal activity from cord compression [15]. The detection of MSL during labour often causes apprehension and anxiety for the patient as well as the

health provider as it is often considered as indication of fetal distress [16]. Generally thick meconium is associated with poor perinatal outcomes [17, 18]. The exact reason of passage of meconium in the liquor is poorly understood. It could reflect the state of compensated fetal distress as it is suggested by few babies who are actually acidotic during labour [19]. Acute or chronic fetal hypoxia can result in the passage of meconium in utero [20]. Also the incidence of meconium passage during labour increases with gestational age 30% at 40 weeks, 50% at 42 weeks [21]. 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 [22]. Presence of meconium below vocal cord is known as meconium aspiration and occurs in 20-30% of all infants with MSAF with around 12% mortality [23]. MSAF alone is not an indication for caesarian section, however with MSAF needs strict supervision during labour for better perinatal outcome [24]. The low apgar scores may be because of direct vasoconstrictor effect of meconium on umblical vein that results in vasospasm in leading to impaired placental blood flow [25]. Infants with APGAR Score<7 at 5 min are three times more likely to have abnormalities on neurological examination [26].

Presence of meconium in absence of fetal heart rate abnormalities is not suggestive of fetal compromise and does not require any intervention [27]. 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 [28]. 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 [29]. Such repetitive 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 defenitive 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 acidemia [30]. In our study, the total number of deliveries was 4210, among which there were 750(17.81%) patients with meconium stained amniotic fluid. Grade I MSL = 220 (29.3%), Grade 2 MSL = 345(46%), Grade 3 MSL =185 (24.7%). (Table 1). Nirmala *et al*, in her study, showed that there were 1267 deliveries among which MSL = 100(7.89%); Grade 1 MSL =39%, grade 2 MSL =43%, grade 3 MSL = 18% [31]. Surekha *et al*, in her study, there were 3673 deliveries among which MSL deliveries = 120(3.48%); Grade 1 MSL=34.16%, Grade 2 MSL= 29.16%, Grade 3 MSL= 36.66% [32]. Rev Sauda *et al*, in his study, he observed 11.9% of MSL deliveries [33]. In our study, out of 750 MSL deliveries, the potential antepartum risk factors for meconium stained liquor were post dated pregnancy (210), PIH (165), Rh isoimmunisation (45), Oligohydramnios (122), Higher Maternal Age (21). The intrapartum risk factors were prolonged PROM (44), IUGR (20), Prolonged labour (11) (Table 2). Shankyan *et al*, in his study, the risk factors for MSL out of 159 deliveries were Postdated pregnancy (47), IUGR (21), PROM (20), Higher Maternal Age (19), PIH (17). In our study, there were 88 (11.73%) babies with APGAR Score <7 among which, 20 (10.81%) babies were in Grade I MSL, 26(5.80%) babies were in Grade 2 MSL and 42 (35.89%) in Grade 3 MSL; p value= <0.05, Statistically Significant. (Table 3). In contrast to our study, Nirmala *et al* in her study, there were only one baby (0.18%) in Grade 3 MSL, no babies in Grade 1 and Grade 2 MSL at 5 minute APGAR Score <7 [31]. In our study there were 276(36.8%) babies with birth weight <2.5kg among which Grade 1 MSL-82(29.71%), Grade 2 MSL-118(42.75%), Grade 3 MSL-76(27.51%).(Table 4).In contrast to our study, Nirmala *et al* in her study, observed birth weight <2.5kg in 1(2.6%) with Grade 1 MSL, 2(4.65%) in Grade 2 MSL, 2(11.11%) in Grade 3 MSL [31]. On the other hand, Rekha Kumari *et al* in her study, observed birth weight <2.5kg in 30(40%) of the neonates who had MSL [36]. In our study, 625(83.3%) of babies remained asymptomatic and required only routine care at birth. 125(16.7%) of babies required NICU admission. Of these 125 babies, 58(46.4%) of babies needed ventilatory support and among them, 38(30.4%) developed meconium aspiration syndrome and 29(23.1%) had severe birth asphyxia. (Table 5). Rekha Kumari *et al* in her study, 63(84.0%) were asymptomatic and 1(1.3%) had birth Asphyxia [35]. Khazardoost *et al* observed 64(21.1%) with meconium aspiration syndrome [36]. Espinheira MC *et al*. in his study, there were 1.4% of NICU admission of which 43.1% needed ventilatory support and 5% had meconium aspiration syndrome [37]. Neonatal mortality count was 15 of which 7 babies were the ones on ventilator and 8 died of birth asphyxia.

Conclusion

Meconium staining of liquor is a commonly observed phenomenon. Presence of meconium is more significant when it is associated with fetal heart rate abnormalities. Meconium Stained Liquor alone is not associated with an adverse neonatal outcome, 86% of babies remained asymptomatic inspite of MSL and required only routine care. Increasing Grade of MSL is associated with increased adverse outcome. Since the presence of thick meconium is associated with increased incidence of perinatal morbidity and mortality, it cannot be overlooked.

Ethical Clearance- Not required.

Conflict of Interest- None

Source of funding- None

References

1. Walker J. Fetal distress. Am J Obstet Gynecol. 1959; 77:94-98.
2. Fenton AN, Steer CM. Fetal distress. Am J Obstet Gynecol 1962; 83:354-59.
3. Low JA, Pancham SR, Worthington O, Bolton RW. The incidense of fetal asphyxia in 600 high risk monitored pregnancies. Am J Obstet Gynecol. 1975; 121:456-59.55
4. Meis PJ, Hall M, Marshall JR, Hobel CJ. Meconium passage: a new classification for risk assessment during labour. Am J Obstet Gynecol. 1978; 131:509-13.
5. Abramovici H, Brandes JM, Fuchs K, Timor FI. Meconium during delivery, a sign of compensated fetal distress. Am J Obstet Gynecol. 1974; 118:251-55
6. Wong SF, Chow KM, Ho LC. The relative risk of foetal distress in pregnancy associated with meconium stained liquor at different gestations. AMJ. Obstet Gynaecol. 2002; 22:594-9.
7. Hackey WE. Meconium Aspiration. In; Gomella TL. Neonatology. 4th Edition. Newyork; Lange Medical Books; 1999, 507.
8. Ashfaq F, Shah AA. Effect of amnioinfusion for meconium stained amniotic fluid on perinatal outcome. J Pak Med Assoc. 2004; 54:322-5.
9. Paz Y, Solt I Zimmer EZ. Variables assosiated with meconium aspiration syndromein labour with thick

meconium. Eur J Obstet Gynaecol Reprod Biol. 2001; 94:27-30.
10. Bhutta ZA, Jalil S. Meconium aspiration syndrome: the role of resuscitation and tracheal suction in prevention. Asia Oceania J Obstet Gynaecol. 1992; 18:13-7.
11. Steer PJ, Daniethian P. Foetal distress in labour. In: James DK, Steer PJ, Weiner CP, Gonaik B. editors. High risk pregnancy: management options. 3rdedition. Philadelpia: Elsevier Inc. 2006, 1450-72.
12. Tybulweicz AT, Clegg SK, Fonte GJ, Stenson BJ. Preterm meconium staining of the amniotic fluid: associated finding and risk of adverse clinical outcome. Arch Dis Child Foetal Neonatal Ed. 2004; 89:F328-30].
13. NICE. Intrapartum guideline 55, London: national institutefor health and clinical excellence, 2007.
14. Gee H. Routin interpartum care; an overview. In: Luesley DM, Baker PN. Obstetrics and gynecology: an evidence based test for MRCOG, 2nd edition. Hodder Arnold 2010, 287-95.
15. Ahanya SN, Lakshmanan J, Morgan DL, Ross MG. Meconium passage in utro: mechanism consequences and management. Obstet Gynecological Surv. 2004; 60:45-56
16. Naqvi SB, Manzor S. association of MSAF with perinatal outcome in pregnant women of 37-42 weeks gestation. Pak J Surg. 2011; 27(4):292-298.
17. Rossi EM, Philipson EH, Williams TG, Kalhan SC. meconium aspiration syndrome: intra partum and neonatal attributes. AMJ Obstet Gynecol 1989; 161:1106-10.
18. Arrow Naranga *et al.* management of mecosaf: a team approach. Indian pediatr 1993; 30:9-13.
19. Abramovici *et al*. meconium during delivery a sign of compensated fetal distress. AMJ Obstet Gynecol. 1974; 118: 215-55.
20. Stark A *et al* meconium aspiration. Manual of neonatal care 2003; 5:402-3.
21. Steer PJ *et al*, fetal distress in labour, high risk pregnancy management options. 3rd edition, Philedelphia, elselver INC, 2006, 1450-72.
22. Sinsck *et al*. A long standing incomprehensible matter of obstetrics: meconium-stained amniotic fliud, a new approach to reason. Arch gynaecol obstet 2008; 278:559-63.
23. Khatun *et al*. fetal outcome in deliveries with MSL – Bangladesh. J child health. 2009; 33(2):41-50.
24. Sasaikala *et al*. Perinatal outcome in relation to mode of delivery in meconium stained amniotic fluid. Indian J Pediatr. 1995; 62:63-67.
25. Althusler G. Hyde S. The meconium induced vasoconstriction; potential cause of cerebral and other fetal hypoperfusion and of poor pregnancy outcomes. J child neurol. 1989; 4:137-42.
26. Levene MI, Sands C, Grindulis H *et al*. Comparison of two methods of predicting outcome in perinatal asphyxia, Lancet 1986; 1:67-69.
27. Miller FC. Meconium staining of amniotic fluid, Clin obstet gynaecol 1975; 121:45-50.
28. Maymon *et al*. MSAF in very low risk pregnancies at term gestation. Eur J Obstet Gynaecol reprod boil. 1988; 80:169-73.
29. Fujikureat *et al*. The significance of meconium staining. AMJ Obstet Gynaecol. 1975; 121:45-50.
30. William McGuire *et al*; BMJ Clinical Evidence. 2007; 11:320
31. Nirmala Dhuhan *et al*. Meconium staining of amniotic fluid, a poor indicator foetal comprimise. JK science. 2010; 12(4)
32. Surekha Tayade *et al*. The significance of meconium stained amniotic fluid – A cross sectional study in rural set up. I J BAR. 2012; 03(12).
33. Rev suadha *et al*, MSAF & maternal & neonatal factors associated. Rev saudepublica. 2012; 46(6):1023-9.
34. Shankyan *et al*, Predictors of Meconium Stained Amniotic Fluid: A possible strategy to reduce neonatal morbidity and mortality J obstet Gynaecol India. 2006; 56(6):514-517.
35. Rekha Kumari *et al*, Foetal outcome in patients with meconium stained liquor. J pak med assoc. 2012; 62(5):474-6.
36. Khazardoost *et al*, risk factors for MA in MSAF, J Obstet Gynaecol. 2007; 27(6):577-9.
37. Espinhera MC *et al*, Meconium aspiration syndrome – the experience of a tertiary centre. Rev portal pneumol. 2011; 17(2):71-6.