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Research Article

Fetal outcome in deliveries with meconium stained liquor

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ABSTRACT

Background: Meconium is a dark greenish mass of desquamated cells, mucus, and bile that accumulates in the bowel of a fetus and is typically discharged shortly after birth. Meconium stained amniotic fluid has long been considered to be a bad predictor of fetal outcome. Presence of meconium in amniotic fluid is a potentially serious sign of fetal compromise and associated with poor perinatal outcome. This prospective observational study was undertaken to find out immediate fetal outcome in meconium stained liquor.

Methods: Design: prospective study. This study was conducted from January 2014 to June 2014. The study included women with meconium stained amniotic fluid in labor with gestational age >37 completed weeks.

Results: Total 100 cases were enrolled. 67% were term patient. Majority of the patients (74%) were in the age group of 21-30 years. Fetal distress occurred in 25% of babies, more in association with thick meconium (13%). Cesarean deliveries were 68%. APGAR scores in first minute was severe (0-3) in 5% and 1% at fifth minute, moderate (4-6) in 8% at first minute and was 4% at fifth minute and mild (7-10) in 86% at first minute and 94% at fifth minute. Admission in neonatal ward was 30% with perinatal mortality of 5%.

Conclusions: Meconium stained amniotic fluid was associated with higher rate of cesarean delivery, increased need for neonatal resuscitation, increased rate of birth asphyxia with hypoxic ischemic encephalopathy, meconium aspiration syndrome, hospital admission and mortality. Meconium stained liquor is more commonly associated with PIH, post-datism, oligohydroamnios and DM.

Keywords: Meconium stained liquor, Fetal outcome

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. Presence of meconium in amniotic fluid is a potentially serious sign of fetal compromise and associated with a poor perinatal outcome including low APGAR scores, increased rate of chorioamnionitis, increased incidence of neonatal intensive care admission and high rate of perinatal death. Incidence of meconium passage is less before 34 weeks of gestations and after 37 weeks its incidence increases steadily with increasing gestational age reflecting the maturation of fetal intestinal

myelination and parasympathetic innervations. Aspiration can occur *in utero* with fetal gasping or after birth with the first breaths of life. A large proportion of women with meconium stained liquor have risk factors simultaneously like preeclampsia, diabetes and post maturity. 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.

METHODS

A prospective observational study was conducted in obstetrics and gynaecology department of our institution from January 2014 to June 2014 and study population included 100 cases of meconium stained liquor during labor and their outcome in terms of mode of delivery and 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
- × Pregnancies with IUGR babies
- × Presentations other than cephalic

Following selection of cases, detailed history was taken and general and systemic examinations were done. Detailed obstetrical examination was undertaken noting the presentation, position, height of fundus, amount of amniotic fluid, fetal heart rate, uterine contractions, and pelvic status. Use of any medications like oxytocin, sedatives, analgesics was also noted. Detailed follow up of the progress of labor was done using partogram to observe whether the progress of labor was coinciding with normal progress. Patients whose progress was smooth according to the partogram were allowed to progress for normal vaginal delivery. Whereas those patients whose progress did not coincide with the partogram were closely observed and artificial rupture of membrane was done at an earlier stage. Also in high risk patients like those with post-datism, oligohydromnios or PIH, early ARM was done. Meconium staining of amniotic fluid was noted during artificial or spontaneous rupture of membranes and its consistency was noted, whether it was thin, moderate or thick. Correlation between cervical dilatation and appearance of meconium in amniotic fluid was noted. Also the fetal heart rate pattern was noted and accordingly the mode of delivery was decided. After birth the newborn was examined by

the obstetrician and neonatologist with continuous follow up daily till discharge from the hospital and re-examined after 15 days in OPD. Fetal outcome was measured by APGAR scores at 1st and 5th minutes, weight, sex, requirement of neonatal resuscitation, admission in neonatal ward and intensive care unit. Relevant investigations including chest X-ray were carried out.

RESULTS

Total 18 cases of meconium stained amniotic fluid were seen during latent phase and all were delivered by cesarean section. In group 2, 45 delivered by cesarean section & 23 by normal vaginal delivery. In group 3, 9 delivered vaginally (Table 1).

Table 1: Correlation between cervical dilatation and meconium passage with mode of delivery.

| Group | Cervical dilatation (cm) | No. of cases | Mode of delivery | |
|-------|--------------------------|--------------|------------------|-------------------------|
| | | | LSCS | Normal vaginal delivery |
| 1 | 0-3 | 18 | 18 | 0 |
| 2 | 4-7 | 68 | 45 | 23 |
| 3 | 8-10 | 14 | 5 | 9 |

The overall incidence of fetal distress in meconium stained amniotic fluid was 25%. Out of which majority (52%) cases had thick meconium liquor developing fetal distress (Table 2).

Table 2: Correlation between meconium staining and fetal distress.

| Type of meconium | No. of babies with fetal distress | % |
|------------------|-----------------------------------|------------|
| Thin (38) | 3 | 12 |
| Moderate (34) | 9 | 36 |
| Thick (28) | 13 | 52 |
| Total | 25 | 100 |

In this study one baby was still born. All the new-born babies were immediately resuscitated & reassessed by 5 minute APGAR score. Out of 13 new-born having APGAR score <7 at 1 minute, 8 improved with resuscitation and 5 neonates needed NICU admission (Table 3).

NICU admission was required in 30 cases, 13 cases had thick meconium (Table 4).

This shows 75% cases had normal fetal heart rate at the time of detection of meconium, 18% had bradycardia and 7% had tachycardia (Table 5).

Birth asphyxia, aspiration pneumonia, respiratory distress syndrome and febrile illness contribute to perinatal morbidity. Perinatal mortality was 5% (Table 6).

Table 3: Comparison of meconium stained amniotic fluid with APGAR score at 1 and 5 minute.

| Type of meconium | APGAR score | | | | | |
|--------------------|-----------------|-------------------|----------------|-----------------|-------------------|----------------|
| | AT 1 minute | | | AT 5 minute | | |
| | 0-3 (severe) | 4-6 (moderate) | 7-10 (mild) | 0-3 (severe) | 4-6 (moderate) | 7-10 (mild) |
| Thin (38) | - | 02 (5.26%) | 36 (94.74%) | - | 01 (2.63%) | 37 (97.37%) |
| Moderate (34) | 02 (5.88%) | 04 (11.76%) | 28 (82.35%) | 00 (0%) | 02 (5.88%) | 32 (94.11%) |
| Thick (28) | 03 (11.11%) | 02 (7.4%) | 22 (81.48%) | 01 ((3.7%) | 01 (3.7%) | 25 (92.59%) |
| Total (100) | 05 | 08 | 86 | 01 | 04 | 94 |

Table 4: Meconium stained liquor and NICU admission.

| Type of meconium | No. of cases | NICU admission |
|------------------|--------------|----------------|
| Thin | 38 | 04 |
| Moderate | 34 | 13 |
| Thick | 28 | 13 |
| Total | 100 | 30 |

Table 5: Correlation between fetal heart rate and degree of meconium stained liquor.

| FHR/min | No. of cases | Degree of meconium | | |
|--------------|--------------|--------------------|----------|-------|
| | | Thin | Moderate | Thick |
| <90 | 4 | 0 | 2 | 3 |
| 90-120 | 14 | 3 | 5 | 6 |
| 120-160 | 75 | 35 | 24 | 15 |
| >160 | 7 | 0 | 3 | 4 |
| Total | 100 | 38 | 34 | 28 |

Table 6: Meconium stained amniotic fluid and perinatal morbidity and mortality.

| Perinatal morbidity | Thin | Moderate | Thick | Total | Perinatal mortality |
|---------------------------------|------|----------|-------|-------|---------------------|
| Birth asphyxia | 0 | 1 | 4 | 5 | 1 |
| Aspiration pneumonia | 3 | 1 | 1 | 5 | 2 |
| Respiratory distress syndrome | - | 2 | 3 | 5 | 1 |
| Febrile illness | 1 | 2 | 2 | 5 | 1 |
| Infection/septicemia | - | 3 | 1 | 4 | 0 |
| Hypoxic ischemic encephalopathy | 0 | 1 | 2 | 3 | 0 |
| Jaundice | - | 1 | 2 | 3 | 0 |
| Convulsion | - | 1 | 1 | 2 | 0 |

DISCUSSION

This study was done to find out the fetal outcome of those deliveries where liquor was meconium stained and to determine the risk of adverse fetal outcome associated with meconium stained amniotic fluid. Majority of the patients (74%) were in the age group 21-30 years. Neke Akhtar et al.,¹ showed that the mean age of mother was 26.2 ± 5.2 years. In present study 67% of the patients with meconium stained amniotic fluid were term patients. Gupta et al.² found significant increased rate (86.7%) of meconium in amniotic fluid after 37 weeks. Oyelese Y et al.³ also proposed similar findings. Present study shows birth weight of 2.6-3 kg in majority of patients. Sedaghatian et al.⁴ observed similar result in their study. Neke et al.¹ found that 77.5% babies had birth weight >2.5 kg. In our study 38% patients had thin meconium, 34% had moderate, 28% had thick meconium. Erum Majid Sheikh et al.⁵ and Piper et al.⁶ observed similar findings. In present study 59% patients had associated

obstetric risk factors like PIH, post-datism, oligohydroamnios, PROM. Out of this 13% patients had PIH. Bhide et al.⁷ found 13.8% having PIH. In present study, 75% cases had normal fetal heart rate at the time of detection of meconium, 18% had bradycardia & 7% had tachycardias which were similar with the findings of Berkus et al.⁸ who observed significantly higher risk of an abnormal fetal heart rate in meconium stained group. Sasikala et al.⁹ found that 26.2% had fetal bradycardia & 6.5% had tachycardia. In present study, APGAR score in first minute was low (<7) in 5.26% patients with thin meconium as compared to 18.51% of patients with thick meconium. Sedaghatian et al.⁴ found similar result in their study. Patil KP et al.¹⁰ observed that 6.74% of patients with thin meconium and 26.25% of patients with thick meconium had low (<7) APGAR score. Mode of delivery was significantly influenced by the presence of meconium stained amniotic fluid. Cesarean deliveries were high (68%), more with thick meconium. Neke et al.¹ also showed comparable results. Chishty AL et al.¹¹

observed 62% of cesarean section rate. Even in places where other facilities of intrapartum monitoring like fetal blood sampling and cardiotocography are available, the rate of caesarian delivery are found to be increased. Gupta et al.² found that birth asphyxia was significantly high in meconium stained amniotic fluid. Khatun M et al.¹² found 12.9% birth asphyxia cases in her study. Whereas present study showed 19.23% developed birth asphyxia. This was comparable to the study conducted by Usha et al.¹³ where perinatal morbidity was 32%. Higher chances of IUGR & intrapartum asphyxia (APGAR score <7) was noted in babies born to mother having snoring & sleep disordered breathing. Aggarwal et al.¹⁴ observed similar findings. In present study mortality rate was 3% in cases with thick meconium and 2% in cases of thin meconium. Khatun M et al.¹³ found 2.9% mortality in meconium stained amniotic fluid with thick meconium. Gupta et al.² found 4.9% mortality in meconium stained amniotic fluid.

CONCLUSION

Meconium stained amniotic fluid is associated with increased need for neonatal resuscitation, increased risk of birth asphyxia, meconium aspiration syndrome, hospital admission and mortality. So identification of pregnant woman at risk of passage of meconium during labour would allow intensive fetal surveillance and early intervention which might lead to reduction in neonatal adverse outcome. Neonatal expertise at the time of delivery with equipments like oxygen mask, laryngoscope, suction catheter, endotracheal tube & AMBU bag should be present and advanced neonatal resuscitation unit is required to decrease fetal morbidity and hence mortality in patients with meconium stained amniotic fluid.

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