Section: Obstetrics & Gynecology

Research

PREGNANCY OUTCOME OF MECONIUM-STAINED AMNIOTIC FLUID IN UNCOMPLICATED TERM PREGNANCIES: A CASE CONTROL STUDY

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Abstract

Background: Evaluation of fetal wellbeing during labor is on the basis of fetal activity and color of liquor in labor in vertex presentation. When there is meconium-stained liquor during labor it could be a sign of fetal distress and response to hypoxic insult. **Materials and Methods:** This are a hospital-based case control study conducted at AL Azhar Medical College, Thodupuzha, Kerala, over a period of one year. All uncomplicated pregnant women of 37-42 weeks of gestation who had meconium-stained amniotic fluid following spontaneous rupture of membrane or artificial rupture of membrane were included in the study. Grading of MSL, FHR abnormality, mode of delivery, APGAR score, NICU admission were measured. **Result:** A total of 339 pregnant women were studied, in that 113 had MSL and taken as study group and rest 226 as control group. In this 52% had abnormal FHR, 28% had spontaneous vaginal delivery.22% had instrumental delivery, 50 % had cesarean section. Rate of low APGAR score was higher in study group .47% babies had NICU admissions. Incidence of meconium aspiration syndrome in our study was 1.2%. **Conclusion:** When fetal scalp PH and umbilical cord lactate estimation facilities are not available association of MSL with abnormal FHR should be taken as fetal distress and consideration of early operative intervention are necessary.

INTRODUCTION

Fetal wellbeing is evaluated mainly on the basis of fetal movements, FHR pattern, and color of amniotic fluid. Presence of meconium-stained liquor is always considered as a sign of fetal distress. although the real cause is not known but it is considered as a physiological maturity of fetus also.[1,2] When there is meconium aspiration it neutralizes the surfactant action and promote inflammation of lung tissues and sometimes it can lead to pulmonary vascular and pulmonary hypertension. So there are conflicting outcomes have been reported when there is meconium stained liquor which differs with degree of meconium staining.[3]

One of the main reason for increased operative deliveries are due to MSAF. 1 When there is presence of meconium below the vocal cord is known as meconium aspiration syndrome .4 According to previous studies only 5% of neonate born through meconium stained amniotic fluid develop MAS.[4] Many studies suggest that perinatal morality is less with MSAF. But there is significant association between the consistency of meconium and abnormal FHR patterns, increased rate of cesarean section and Low APGAR score.[1,5]

So the present study was done to find out the maternal and perinatal outcome with meconium stained amniotic fluid at term pregnancies as the direct and indirect effect of MSL remain uncertain, but it should be considered as predictor of maternal and perinatal morbidity and mortality.[2]

MATERIALS AND METHODS

It is a hospital-based case control study conducted in the Department of obstetrics and gynecology, Al Azhar Medical College, Thodupuzha, Kerala, from march 2020 to march 2021. Study population comprised of a total of 339 pregnant women, in that 113 patients had meconium-stained liquor and taken as study group and rest 226 patients had normal liquor and taken as control group after spontaneous or artificial rupture of membrane. Meconium-stained liquor was graded as thick MSL and thin MSL and were monitored continuously with CTG.

MSL is considered thick when the fluid is green in color, viscous, tenacious and containing large amount of particulate material and thin if the fluid is

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lightly stained without particulate material. Intrapartum cardiotocographic tracing taken for assessing fetal hypoxia during labor and fetal heart rate below 110 bpm was considered as bradycardia and fetal heart rate above 160 was considered as tachycardia. APGAR score of newborns was assessed at 1 minute. if APGAR score was 7 or more then babies were considered as non-asphyxiated and in good condition. If the score is between 4 to 7 then it was considered as moderately asphyxiated and if score is less than 4, grossly asphyxiated babies. All the babies who have APGAR score above 6 were placed with mother. babies with score <5 were transferred to NICU.

Sample size was calculated by n=4pq/l2 considering the prevalence of meconium-stained liquor as 18 % from previous literature, allowable error as 5% and confidence interval as 95%.to prevent measurement error control group were taken as 1:2 ratios and comprised of 226 pregnant women.

Inclusion Criteria

Singleton pregnancies at 37-42 weeks of gestation with cephalic presentation admitted in al azhar medical college with clear or meconium-stained amniotic fluid following spontaneous or artificial rupture of membrane during labor.

Exclusion Criteria

1. Previous cesarean section
2. Any medical comorbidities
3. Malpresentation
4. IUGR
5. Multiple gestation
6. Anomalous fetus

Study Parameters

1. Maternal age
2. Parity
3. Gestational age
4. Onset of labor
5. Mode of delivery
6. Grading of MSL
7. FHR pattern
8. Apgar score
9. NICU stay

RESULTS

During the study period total number of patients were 339, in those 113 patients had meconium-stained liquor after spontaneous or artificial rupture rupture of membrane were taken as study group, and rest 226 were taken as control group as they had clear amniotic fluid after membrane rupture. In both groups maternal age of the patients were 20-25 years of age which was comparable in both groups. in our observation incidence of primigravida 58.2% and multigravida was 40.5% in study group.

Incidence of meconium-stained amniotic fluid is 24%in our study, incidence was higher may be due to usage of misoprostol as an inducing agent. In our present study incidence of thin MSL was 27% and thick MSL was 63%. In present study abnormal FHR was 33% of study group and 16.1 % of control group.

In present study cesarean section was highest in thick MSL that was 67.4% and out of 113 total cases 50% delivered by cesarean section where as in control group it was 44%. The main indication for Cesarean section in our study group was due to fetal distress due to MSL associated abnormal FHR.

In our study group 75.7% babies has Apgar score 7-10 at 1 minute and 24.3% babies had score of less than 6 in 1 minute whereas in control group 94% of cases had Apgar score of 7-10 in 1 minute and only 6 % cases had less than 7. In our study 5-minute Apgar score >7 was 95.6% in study group compared to control group of 99.8%. only 4% babies had Apgar score less than 6 at 5 minutes in study group

In present study showed that need for NICU care needed more in MSAF babies than control group. Out of major complications which happen through deliveries of MSAF babies, birth asphyxia was common complication.

DISCUSSION

Meconium-stained amniotic fluid is considered as an important factor for fetal wellbeing during intrapartum and postpartum period. If meconium is found in amniotic fluid of cephalic presentation is greater concern for when compared to breech presentation as it is insignificant because it happens when mechanical compression of fetal abdomen happens.[6]

When meconium is present in amniotic fluid during labor often causes anxiety as it has poor perinatal outcome.[7] fetal wellbeing during labor is assessed by abnormal fetal heart rate and checking the color of liquor. It is assumed that when there is FHR abnormality in the presence of meconium-stained liquor it indicates hypoxia and acidosis.[8] Wiswell et al in his study stated that there is an association between FHR abnormalities, low Apgar score and low arterial cord PH in the presence of meconium stained amniotic fluid.[9]

So this present study was done to evaluate the significance of meconium stained amniotic fluid and its perinatal outcome in patients admitted to AL Azhar Medical College, Obstetrics and Gynecology department labor room with spontaneous rupture of membrane or artificial rupture of membrane from march 2020 march 2021.Out of 1400 deliveries conducted in our hospital during this period. In that 339 cases were included in our study which fulfilled the inclusion criteria.

Incidence of meconium-stained amniotic fluid in our study was 24% it was higher because of using misoprostol as inducing agent, at the same time the incidence by other studies listed below.

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Year	Authors	Incidence
1997	Hari bhasker,[10]	11.2
2006	Nirmal,[11]	11.76
2006	Partha,[12]	9.2
2006	Supriya,[13]	6.2
2022	Present study	24%

Debdas et al, arun et al suggest that incidence of thin MSL was higher as compared to thick MSL whereas Nimal et al and Sureka et al found that thick MSL was having high incidence as compared to incidence of thin MSL. Which was comparable to our study.

Authors	Thin MSAF	Thick MSAF
Arun,[14]	51.5%	48.8%
Nirmal,[11]	37%	63%
Surekha,[15]	34.1%	36.6%
Present study	27%	63%

In our study mean gestational age is 39 weeks in both groups it is evident that 9% mother in study group had postdated pregnancy in comparison with control group. This explains that meconium passage is common in postdated pregnancy. Similarly, Becker et al and Miller et al states that frequency of MSAF increases with advance gestational age.[16,17]
in our present study abnormal FHR was found in 33% of study group and 16.1 % of control group. Salma et al and Patil et al also concluded that CTG abnormalities in MSAF was higher.[18,19]
In our study thick MSL had higher incidence of cesarean section rate that was 67.4% and out of 113 total cases 50 % delivered by cesarean section where as in control group it was 44%. The indication for cesarean section in study group was fetal distress by MSL associated abnormal FHR.

Authors	Incidence of CS
Supriya,[13]	47.2%
Partha,[12]	41%
Present study	50.9

In study group 75.7% babies has Apgar score 7-10 at 1 minute and 24.3% babies had score of less than 6 in 1 minute whereas in control group 94% of cases had Apgar score of 7-10 in 1 minute and only 6 % cases had less than 7. In our study 5-minute Apgar score >7 was 95.6% in study group compared to control group of 99.8%. only 4% babies had Apgar score less than 6 at 5 minute in study group. Similarly, Sureka et al concluded that low Apgar score at 1 and 5 minutes were statistically significant but Becker et al from his study concluded that there was no statistically significant difference in Apgar score.[15,16] low Apgar score in meconium stained amniotic fluid is due to direct vasoconstrictor effect of meconium on umbilical vein that can cause vasospasm leading to impaired placental blood flow.
The need for NICU care was more in MSAF group babies than of control group similar observation was done by Goud et al. He concluded that 54% of MSAF babies required NICU care.

Out of all major complications birth asphyxia was the major complication with meconium-stained amniotic fluid.

Limitation
Due to Non availability of fetal scalp PH or umbilical cord lactate fetal distress was not confirmed.

CONCLUSION

When fetal scalp PH and umbilical cord lactate estimation facilities are not available, association of MSL with abnormal FHR can be taken as fetal distress and consideration of early operative intervention necessary.

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