

Neonatal outcome in meconium stained amniotic fluid-one year experience

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Abstract

Objectives: To determine the effect of clear liquor and meconium stained liquor on mode of delivery, and to evaluate neonatal outcome.

Methods: It was a Cross sectional analytical study, conducted in the department of Obstetrics and Gynaecology, Shaikh Zyed Federal Postgraduate Medical Institute / Hospital, Lahore and Shaikh Zaid Women Hospital Larkana, from April 2006 to March 2007. Two hundred and fifty patients from Larkana and 250 patients from Lahore in clear liquor group were included in the study. Similarly 125 patients from each city, that is 250 patients which had meconium stained liquor were included in group 2.

The subjects with meconium stained amniotic fluid and clear amniotic fluid were registered as group 1 and 2. The socio demographic information, fertility history and gestational age of subjects were recorded. The investigations and information regarding mode of delivery and duration of labour were also noted. All babies delivered were attended by paediatricians.

Results: In this study 500 cases with clear liquor and 250 cases of meconium stained liquor were selected from two cities, Lahore and Larkana. Out of these 55 (22%) patients had grade I meconium stained liquor, 140 (56%) patients and 55 (22%) patients had grade II and grade III meconium stained liquor respectively.

The mode of delivery is significantly affected by meconium staining of liquor. The effect of meconium stained liquor was significant on time of delivery. There were 40 (16%) post date deliveries in meconium stained liquor as compared to 1% in subjects with clear liquor. The effect of meconium staining of liquor was significant on Apgar score, neonatal admission, meconium aspiration syndrome and neonatal deaths.

Conclusion: Meconium stained amniotic fluid (MSAF), is associated with increased neonatal morbidity and mortality. Caesarean sections were performed twice as frequently in women presenting with MSAF (JPMA 60:711; 2010).

Introduction

The presence of meconium stained amniotic fluid (MSAF) is a serious sign of foetal compromise, which is associated with an increase in prenatal morbidity,^{1,2} clear amniotic fluid on the other hand is considered reassuring. In earlier days, early amniotomy with active management of labour was done to detect meconium passed during labour.³ Amniotomy in labour is also commonly performed to detect meconium where foetal heart rate is unsatisfactory.⁴ If meconium stained amniotic fluid (MSAF) is found, then continuous foetal heart rate monitoring is required for foetal well being.⁵

The exact etiology of MSAF remains unclear.^{6,7} Previous studies have demonstrated that the incidence of MSAF rises with gestational age. A study by Mathews and Warshaw⁸ found that in 98.4% of cases with meconium stained liquor, the neonates were admitted to the neonatal intensive care units, these were delivered at 37 weeks of gestational age or later as it shows maturation of autonomic nervous system.

Aspiration of meconium during intrauterine life may result in or contribute to meconium aspiration syndrome (MAS), representing a leading cause of perinatal death.⁹ MAS is more frequently seen in post term pregnancy or in growth restricted fetuses. Factors such as placental insufficiency, maternal hypertension, pre-eclampsia, oligohydroamnios or maternal drug abuse (tobacco or cocaine) result in, inutero passage of meconium. Meconium stained liquor may be aspirated during delivery resulting in Neonatal respiratory distress syndrome.¹⁰

The incidence of admission to newborn intensive care unit with, respiratory distress syndrome, meconium aspiration syndrome,¹¹ neonatal asphyxia,¹² chorioamnionitis,¹³ foetal distress or foetal acidosis^{1,4} were higher in pregnancies complicated by meconium stained liquor. MSAF occurs in 10% of pregnancies with most occurring at term or particularly post term. Mean APGAR scores were significantly lower and the proportion of neonates with poor APGAR scores were higher if thick meconium was present, but not for thin meconium. Prolonged labour was more common or was associated with worst outcome in meconium

stained liquor.

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 purpose of this study was to evaluate the effect of clear liquor and meconium stained liquor on time and mode of delivery and to find out neonatal morbidity and mortality associated with meconium stained amniotic fluid.

Subjects and Methods

The study was done at Shaikh Zaid Women Hospital Larkana and Shaikh Zyed Federal Postgraduate Medical Institute/Hospital Lahore. It was a prospective cross sectional analytical study which included 500 cases of clear amniotic fluid and 250 cases of meconium stained liquor from Lahore and Larkana. Information from the data collected was shared collectively on a Performa. From April 2006 to March 2007 about 1750 women were admitted in labour. A total of 750 women were included in the study, in which 500 women had clear amniotic fluid and 250 had meconium stained liquor. One thousand women were excluded from this study because of breech presentation, major congenital anomaly, still birth or gestational age of less than 32 weeks.

Two hundred and fifty patients from the clear liquor group were included from each hospital, i.e; 500 patients from both hospitals. Similarly 125 patients of meconium stained liquor admitted at both hospitals were included in the study. Obstetrical data was collected prospectively on a Performa, although for infants admitted to neonatology, data was collected by a postgraduate medical student.

Women were eligible for inclusion if they had a singleton pregnancy with presence of meconium stained liquor during labour. Matched group of subjects with clear amniotic fluid were also included.

Exclusion criteria for this study included breach presentation, still birth, congenital foetal abnormalities or any women with chronic disease e.g. renal or pulmonary disease. Primi gravida or multigravida above 37 weeks without any risk factors i.e; pregnancy induced hypertension (PIH), eclampsia, gestational diabetes mellitus (GDM), previous caesarian section or any other medical disorder, were excluded from the study.

Foetal heart rate (FHR) monitoring was done with intermittent auscultation only. If meconium was detected in liquor after artificial rupture of membranes then 20 minutes cardiotocography was done. Mode of delivery was decided after considering all obstetrical conditions. The study was approved by the ethical committees of both hospitals.

Women were classified in two groups. Group I with clear amniotic fluid, and group II with meconium stained

amniotic fluid. Meconium stained liquor was again divided into three grades. Grade I was thin yellow colour meconium, grade II was light green colour, where as grade three was thick paste like, green coloured meconium.

Amnio infusion can be used to prevent foetal distress due to meconium stained amniotic fluid,¹⁵ but it was not done in this study as facilities were not available.

All data was entered in SPSS version 10 to analyze through its statistical programme. The mode of delivery and duration of labour in hours was recorded. The condition of neonate i.e.; Apgar score, and general condition and the need for admission in nursery were also recorded. These items were compared in two groups from both hospitals and tested statistically for significance.

Statistical Analysis. All results for continuous variables are expressed as mean + SD. The P values for comparisons of categorical variables were generated by chi-square test for proportions with appropriate degrees of freedom and P value of less than 0.05 according to the two sided MV Nemor test were considered to indicate statistical significance. All calculations were done with SPSS 10.0 (Statistical package for social sciences, Chicago).

Results

Of the 750 cases, 250 were complicated by meconium stained liquor.

The meconium was described as grade I in 55 (22%) patients, grade-II in 140 (56%) patients, and 55 (22%) patients had grade-III meconium staining of liquor. Prolonged labour i.e; greater than 12 hours was seen in 30 (6%) patients with MSAF as compared to 1% in subjects with clear liquor group.

The rate of MSAF increased with gestational age. There were 120 preterm deliveries with clear, and two preterm deliveries with meconium stained amniotic fluid. There were 40 (16%) post date deliveries in subjects with meconium stained amniotic fluid and 5 (1%) post date deliveries in subjects with clear liquor group.

Among 250 women with MSAF 205 women delivered by caesarean section and 35 (14%) women had vaginal deliveries, in comparison, 335 women (67%) with clear liquor delivered by vaginal route and only 90 women (18%) delivered by lower segment caesarean section. Instrumental delivery was used in 10 (4%) cases in Group I, and 75 (15%) in Group-II.

On comparing mean APGAR score at one and five minutes in both groups, it was found that significantly lower Apgar score were seen in subjects with MSAF as compared to the clear liquor group. The 1 min Apgar score was low (5 ± 0.5) in subjects in the MSAF (group I) as compared to subjects with clear liquor, where the Apgar score was 6 ± 0.9 . The 5

minute APGAR was 7.6 ± 0.8 , in group I and 8.5 ± 0.7 in group II. Decision regarding neonatal nursery admission was made by a paediatrician. Babies admitted in nursery were followed till discharge or mortality.

Out of 70 small for gestational age babies, 50 babies (10%) were born to clear liquor while 20 (8%) babies were born in subjects with MSAF. Out of 625 appropriate for gestational age, 420 babies were born to patients with clear liquor and 205 babies were born in MSAF group. Twenty large for gestational age babies were born to subjects with MSAF while 30 large for gestational age babies were born in the clear liquor group. One hundred and sixty five (63%) neonates, in meconium stained group were admitted in nursery and 85 (34%) babies did not require admission. Whereas out of 500 subjects with clear liquor only 85 babies were admitted and the rest of them did not require admission. Meconium aspiration syndrome was found in 115 (46%) neonates with meconium stained amniotic fluid, while 135 (54%) babies had no meconium aspiration syndrome.

There was one neonatal death due to MSAF, on the contrary no neonatal mortality was seen in the group with clear amniotic fluid.

Discussion

Meconium stained amniotic fluid (MSAF), is a commonly observed phenomenon. The presence of thick meconium is associated with increased incidence of perinatal morbidity and mortality.

Our results are similar to the study conducted by Sheiner¹⁶ showing 78% of cases having thin meconium stained amniotic fluid and 22% with thick meconium. Other studies have reported incidence varying between 7-22% of live births.^{17,18}

In post term pregnancies the incidence varies from 28-52%.¹⁹ In our study there were 16% Post date deliveries in subjects with meconium stained amniotic fluid and 1% post date delivery in subjects with clear liquor group.

Our findings closely resemble with those of Scott & Walker,¹⁴ who reported the incidence of meconium stained amniotic fluid to be 5% in preterm delivery. The incidence of MSAF was 4% in our study.

Prolonged labour is also a risk factor for the passage of meconium as proved by Saunder et al²⁰ who showed that prolonged labour is associated with worst outcome in MSAF group.

It is not uncommon for obstetricians to be more aggressive in labours with meconium stained amniotic fluid leading to higher caesarean section rate, which was 82% in our study. In contrast the caesarean section rate in the clear liquor group was 18% (82% Vs 18% $P < 0.05$). Saunders et al²⁰

reported that caesarean sections were performed twice as frequently in subjects with meconium stained amniotic fluid, the higher rate may be due to lack of facilities such as, foetal scalp PH monitoring and tracings of foetal electronic monitoring.²⁰

Prolonged Rupture of membranes also showed to be a risk factor as majority of cases with MSAF had prolonged rupture of membranes compared with only 5% of cases in clear liquor group.

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.²¹

As meconium should always be considered a marker for foetal distress therefore there was a significant effect on the Apgar score of neonates. In this study the mean Apgar score of neonates with MSAF in group-I was 5.0 ± 0.5 were as in group-II it was 6.0 ± 0.9 with a mean standard deviation of 0.5 ± 0.9 respectively.

Scott et al¹⁴ reported the same incidence as in our study of neonatal admissions in nursery ($P < 0.001$). Sood et al²² also showed a high incidence of meconium aspiration syndrome as in our study (< 0.001)

There was one neonatal death in a Patient with MSAF giving the frequency to be 2%. The rate of neonatal asphyxia in the meconium stained cases was significantly higher than that without meconium. Early amniotomy could be beneficial in post dated pregnancies complicated by abnormal foetal heart rate patterns or pregnancies complicated by other high risk factors.

Amnioinfusion can be used to relieve umbilical cord compression during labour, hence is useful in decreasing C-Section rate.

Prevention of MSA can be achieved by avoiding post maturity, as decreased term of gestation reduces perinatal mortality.

Conclusion

Based on our study we conclude that meconium stained amniotic fluid is associated with increased incidence of caesarean section, lower APGAR score, neonatal nursery admissions and meconium aspiration syndrome (MAS).

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