

Original article:

Maternal risk factors and the perinatal outcome in meconium stained amniotic fluid at Pravara Rural Hospital, Loni

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ABSTRACT

BACKGROUND AND OBJECTIVES: Meconium stained amniotic fluid has been considered a sign of fetal distress in presentations other than breech and associated with poor fetal outcome but others considered meconium passage by fetus as physiological phenomenon and produces environmental hazards to fetus before birth. Such magnitude of different opinion was the object behind taking up of this study and aim of it was to find out the maternal risk factors associated and its correlation with the fetal outcome in terms of morbidity and mortality.

METHODS: 100 women in labour with meconium stained amniotic fluid studied considering the inclusion criteria in the Department of Obstetrics and Gynecology, Pravara Rural Hospital, Loni. Cases divided into two -‘thin’ and ‘thick’ meconium stained group. Maternal and Fetal monitoring, uterine contraction assessed and Apgar score, birth weight, resuscitation of baby noted. All babies of both group followed up to first week neonatal life.

RESULTS: In our study, among 100 cases, 45% of the cases had thin meconium and 55% had thick meconium. Increased incidence of meconium staining was seen in crossed dates. The other risk factors were hypertension, anemia, oligohydramnios, IUGR. 56% went in for cesarean section due to intrapartum fetal distress. 33% of the cases went into NICU in view of low APGAR score due to birth asphyxia and meconium aspiration syndrome. Perinatal death was seen in 4 cases, one due to birth asphyxia and the other three due to MAS.

CONCLUSION: Based on this study we conclude that meconium stained amniotic fluid is associated with increased incidence of caesarean section, low APGAR score, meconium aspiration syndrome and increased NICU admission.

INTRODUCTION

Meconium, the gastrointestinal excreta of the fetus was named by Aristotle. The word meconium is derived from Greek word „Meconium Arion“ which means opium like or poppy like substances causing sleeping state of the fetus in mother’s womb.

Meconium staining of AF is a commonly observed phenomenon in day-to-day practice of obstetrics and its significance as a sign of fetal distress is controversial. The passage of meconium in utero has been described by various authors by different mechanisms. Three theories have been suggested for fetal passage of meconium.

- a) The pathological explanation proposes that fetuses pass meconium in response to fetal hypoxia.
- b) In utero passage of meconium represents normal gastrointestinal tract maturation, which is under neural control.

- c) Commonly, meconium passage occurs following relaxation of anal sphincter and increased peristalsis due to vagal stimulation.
- d) By the end of the sixteenth week of gestation the gastrointestinal functions of the fetus are sufficiently developed to absorb much of water from it, propel the unabsorbed matter as far as the lower colon.
- e) The major goal of obstetric care is to prevent maternal and fetal morbidity and mortality. To reduce fetal morbidity and mortality early identification of markers of fetal distress is important.

The classical signs or markers of fetal hypoxia are loss of fetal movements or decreased fetal movements, variations in fetal heart rate pattern, presence of meconium in AF, presence of fetal moulding and decrease in fetal scalp blood pH. The presence of MSAF is believed to be one of the oldest and surest sign of fetal distress in utero due to fetal hypoxia. At the other end of spectrum, meconium passage is a normal physiological event in a term fetus and is not a sign of fetal distress in the absence of fetal heart rate abnormalities.

METHODOLOGY

The study was undertaken in the department of Obstetrics and Gynecology. The study includes, 100 cases admitted in hospital after 37 weeks of pregnancy in labor who exhibit meconium stained liquor after spontaneous or artificial rupture of membranes.

The study was conducted on pregnant women admitted to hospital after 37 weeks of pregnancy in labor with their consent. Data was collected from antenatal history and clinical examination.

INCLUSION CRITERIA:

- Term labour (>37 completed weeks)
- Cephalic presentation.

EXCLUSION CRITERIA:

- Antepartum hemorrhage
- Malpresentations
- Pregnancy with congenital malformations.
- Intrauterine death

RESULTS:

Table 1: Frequency and type of meconium staining of AF of total deliveries

N=100

Amniotic fluid	Number of Cases	Percentage
Thin meconium stained AF (Grade-I)	45	45
Thick meconium stained AF (Grade-II)	55	55
Total	100	100

Out of the 100 cases delivered, 45% were with thin meconium stained amniotic fluid and 55% cases were with thick meconium stained amniotic fluid.

Table 2: Frequency of different group of meconium stained cases (clinical grading)

n = 100

Clinical gradation	Number of cases	Percentage
Grade-I(Thin)	45	45
Grade-II(Thick)	55	55

Among the cases of meconium staining of AF, Thin meconium constituted 45% of cases and thick meconium in 55% cases. Maximum number of cases was thick meconium stained.

Table 3: Incidence of meconium stained AF in different age group

Total No. of cases – 100

Age group in Years	No. of cases	Percentage	Mean age
20years & below	16	16	19.40
21-25 years	45	45	22.73
26-30 years	30	30	28.95
Above 30years	9	9	32

Incidence of meconium stained amniotic fluid has been shown in different age groups. Large group of cases belong to 21-25 age group accounting to 45% of total. Only 5% of difference was seen between the age group of 26 – 30yrs compared to 21 – 25yrs.

Table 4: Correlation of booking status with meconium staining

Booking Status	Thin Meconium		Thick Meconium		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Booked	26	26	33	33	59	59
Unbooked	19	19	22	22	41	41
Total	45	45	55	55	100	100

Table 5: Incidence of Gravidity in 100 cases of meconium stained deliveries

Gravidity	Thin Meconium		Thick Meconium		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Primigravida	23	23	38	38	61	61
Multigravida	22	22	17	17	39	39
Total	45	45	55	55	100	100

Chi square test – 3.36, P value > 0.05

Incidence of meconium stained liquor was more common in Primigravida compared to Multigravida. There was no significant association with gravidity and the consistency of meconium.

Table 6: Correlation of gestational age

Gestational age group in weeks	No. of cases	Percentage	Mean gestational age in weeks
< 37	04	04	35.5
37-39	44	44	38.5
40-42	52	52	41

Increased incidence of MSAF is noted in gestation > 40 weeks. Large group of cases belong to gestational age 40-42weeks with a mean gestational age of 41 weeks

Table 7: Antenatal and intrapartum risk factors associated with meconium staining

Risk Factors	No. of Cases	Percentage
Hypertension	6	6
Anaemia	4	4
IUGR	1	1
Oligohydramnios	8	8
Prolonged labour	10	10
More than one risk factor	10	10
No risk factors	61	61

Chi square test – 14.18, P value < 0.05

Maternal Antepartum and intrapartum risk factors in cases of meconium stained amniotic fluid included Oligohydramnios, Hypertension, Anaemia, IUGR, Prolonged labour. More than one risk factor was seen in 10 cases. Cases with crossed dates had increased incidence of meconium stained amniotic fluid.

Table 8: Correlation of mode of onset of labour with meconium staining

Mode of onset of Labour	Thin Meconium		Thick Meconium		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Spontaneous	40	40	38	38	78	78
Induced	5	5	17	17	22	22
Total	45	45	55	55	100	100

Chi square test – 5.82, P value < 0.05

Table shows 40% cases had spontaneous labour in thin meconium group, where as in thick meconium group it was 38%. Among the induced cases, 22 cases had meconium stained liquor. Increased association of meconium staining was seen in mothers with spontaneous onset of labour probably because of other associated risk factors.

Table 9: Correlation of CTG with meconium staining

NST	Thin Meconium		Thick Meconium		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Reactive	20	20	12	12	32	32
Non-Reactive	25	25	43	43	68	68
Total	45	45	55	55	100	100

Table shows 68% non-reactive CTG among which 43% were of thick meconium group.

Chi square test – 5.82, P value < 0.05

The present study showed that there was a significant association between the consistency of meconium and CTG.

In the present study, there was a significant association with the consistency of meconium and the mode of delivery.

This table shows that mode of delivery varies according to grading of meconium staining. Incidence of Cesarean Section was highest in thick group 35% compared to 21% in thin group due to increased non reactive CTG associated with meconium staining.

The present study shows that, meconium stained liquor significantly increased the neonatal morbidity.

Total neonatal morbidity in meconium stained cases was 33%. Neonatal morbidity was highest in thick meconium stained groups that is about 22%.

Among the 12 cases of MAS, 1 baby had still birth and 3 died in the first week neonatal period.

Table 10: Fetal outcome in meconium stained liquor

Fetal outcome	Thin group	Thick group	Total	%
Still birth	0	1	1	1%
Neonatal Death	1	2	3	3%
Cured	44	52	96	96%

Thick meconium stained group was more complicated than that of the thin meconium stained group outcome.

DISCUSSION

Meconium stained amniotic fluid (MSAF), is a commonly observed phenomenon. MSAF has been implicated as a factor influencing fetal well being during the intrapartum and postpartum periods. Presence of meconium in AF in cephalic presentation was of great concern even to the midwives and obstetricians of old age (Mittler and Mittler 1947). Passage of meconium, once thought to be a sure sign of fetal death in utero (Schultz 1925) but later it was realized to be a sign of fetal hypoxia, not actually fetal death (James Walker, 1954). Even the modern obstetricians are fully aware of this fact and they cannot be indifferent at the light of meconium in AF during labour which calls for close vigilance of the fetal well being. The present study was undertaken to evaluate the significance of MSAF, its fetal outcome and the maternal risk factors associated with it in cases admitted to PIMS, LONI. During this period 100 cases of meconium stained amniotic fluid cases were included in the study which fulfilled the inclusion criteria. 45 of the 100 cases had thin meconium and 55 cases had thick meconium stained amniotic fluid noted at the time of spontaneous / artificial rupture of membranes.

In the present study patients with thin meconium stained amniotic fluid were 45% and patients with thick MSAF were 55%. This was in comparison with the study done by Arun and others but the study done in Pakistan by Erum Majid Shaikh had more patients with thin MSAF.

James¹⁴ mentions incidence of MSAF increases with gestational age and reaches approximately 30% at 40 weeks and 50% at 42 weeks. Hiremath P B⁶⁵ and others did a similar study in which the gestational age from 40 – 42 weeks was upto 36% and they had large number of cases (40%) > 42 weeks. In present study large group of cases belong to gestational age 40 - 42 weeks.

In present study following were the associated ante partum and intrapartum risk factors - prolonged labour, hypertensive disorder, Oligohydramnios, IUGR, Anaemia. Cases with crossed dates had increased incidence of MSAF. More than one risk factor was seen in 10 cases. In the study conducted by Hiremath P B⁶⁵, 33% of MSAF cases had anemia and 42% of MSAF cases had hypertension.

In our study non reactive NST was 68%. Non reactive NST was more in thick group 43% compared to thin group 25%.

Early detection of foetal distress through non reactive NST helped in reducing the neonatal morbidity and mortality. Percentage of asphyxiated babies was different in different groups of MSAF. In our study it was 10% in thin group and 16% in thick group. Shows birth asphyxia is more common in thick group compared to thin group.

CONCLUSION:

The incidence of meconium stained amniotic fluid greatly varies with maternal antenatal and intrapartum risk factors. Increased incidence was seen in cases with crossed dates. Prolonged labour, oligohydramnios and hypertension prevailed more compared to other factors and had a significant association with meconium stained liquor, $P < 0.05$. Since all foetuses with meconium passage in labour do not have associated maternal risk factor and do not have adverse outcome, it is important to distinguish those who are destined to develop foetal distress promptly and intervene accordingly to prevent meconium aspiration syndrome and sequel.

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