



STUDY OF MECONIUM STAINED AMNIOTIC FLUID AND NEONATAL OUTCOME

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ABSTRACT

BACKGROUND: Study of Meconium stained Amniotic Fluid and Neonatal outcome

MATERIALS AND METHODS: It is a prospective study conducted over a period of 1 year at Sushila Tiwari Hospital.

Selection criteria.

INCLUSION CRITERIA: 1: Gestational age > 37 wks, 2: Cephalic presentation, 3: Singleton pregnancy.

EXCLUSION CRITERIA: 1: gestational age < 37 wks, 2: previous caesarean section, 3: multiple pregnancy, 4: non cephalic presentation.

RESULTS: Total no. of deliveries during period was 2250, of which 428 were meconium stained. Overall incidence of meconium stained cases was 19%. Mean gestational age was 39.6 weeks. Mean maternal age was 23.81. Thin meconium cases had higher percentage of normal vaginal delivery 35.29% as compared to thick meconium stained cases 29.16%. 1 minute APGAR were decreased significantly in APGAR at 5 minutes. Incidence of neonatal death and still birth was 18.66% and 5.33%.

CONCLUSION: Alone MSAF is not an indicator of fetal outcome. Overall neonatal morbidity and mortality is higher in MSAF group Because of increased NICU admissions, deprivation from breast milk and later on lack of bonding with mother and other morbidities, overall rate of weight gain is slow in MSAF group.

KEYWORDS :

INTRODUCTION

Meconium is the sterile, thick, black- green, odorless material that results from the accumulation of debris in the fetal intestine during the later months of gestation which is passed as the baby's first bowel motion after birth.

The component of meconium include water (72-80%), desquamated cells from the intestine and skin, lanugo hair, fatty material from the vernix caseosa, amniotic fluid, intestinal secretions, blood group-specific glycoproteins, bile and drug metabolites.

Meconium stained amniotic fluid is when the baby's anal sphincter relaxed inside the uterus, makes the waters look green, yellowish or brownish in colour. It is quite rare if the baby is premature (less than 37 weeks)

Three reasons that a baby's anal sphincter relaxed before birth-

- 1: Because their digestive system has reached maturity and the bowel has begun working. This is the most common reason, meconium stained amniotic fluid may result from a post term fetus with rising motilin levels and normal gastrointestinal function.
- 2: Because their cord or head is being compressed during labour i.e. a vagally mediated gastrointestinal peristalsis - the same reflux which cause variable heart rate deceleration. This is normal physiological response and can happen without fetal distress.
- 3: However the exact relationship between fetal distress and meconium stained liquor is uncertain. The theory is that intestinal ischaemia relaxes the anal sphincter and increases gastrointestinal tract peristalsis resulting passage of meconium. However fetal distress can be present without meconium and meconium can be present without fetal distress.

Meconium stained liquor is usually associated with a response from the baby having a temporarily reduced oxygen supply at some point of time (usually during labour) or a slowly reducing level of oxygen over a period of time.

Severe meconium aspiration syndrome appears to be caused by pathological intrauterine processes, primary chronic hypoxia, acidosis and infection. MAS are an extremely rare complication.

During labour and birth it is very unlikely that a baby will inhale liquor. This will only happen if the baby becomes extremely hypoxic and begins to gasp in-utero in an attempt to get oxygen. Meconium + hypoxic baby = possibility of MAS

Meconium Stained Amniotic Fluid is associated with multiple markers of fetal distress. Meconium stained baby have in general lower scalp PH and lower umbilical cord artery PH in comparison with baby born through clear amniotic fluid. MSAF is associated with increase in perinatal morbidity and mortality. Thick meconium carries an increased risk of perinatal asphyxia, meconium aspiration syndrome and neonatal mortality.

Meconium itself, or the resultant chemical pneumonitis, mechanically obstructs the small airways. This causes atelectasis and "ball-valve effect" with resultant air trapping and possibly air leak.

OBJECTIVE:

1. To Study incidence of meconium stained liquor.
2. To Study neonatal outcome in meconium stained amniotic fluid.

MATERIALS AND METHODS

STUDY DESIGN: Prospective study

STUDY GROUP: Total 2250 patient were admitted and delivered in OBS and GYN DEPARTMENT of DR.Susheela Tiwari Memorial Hospital, Haldwani, Uttarakhand.

STUDY SETTING: labour room and operation theater of DR.Susheela Tiwari Memorial Hospital, Haldwani, Uttarakhand.

INCLUSION CRITERIA:

- 1: Gestational age > 37 wks

- 2: Cephalic presentation
- 3: Singleton pregnancy

EXCLUSION CRITERIA:

- 1: gestational age < 37 wks
- 2: previous caesarean section
- 3: multiple pregnancy
- 4: non cephalic presentation.

METHOD:

The patient who fulfill the inclusion criteria were enrolled in the study. The meconium staining of amniotic fluid was classified as Grade 1,2,3 by visual examination after spontaneous or artificial rupture of membranes.

Grade1: Meconium stained liquor is translucent, light yellow green in colour.

Grade2: MSL is opalescent with deep green and light yellow in colour.

Grade3: MSL is opaque and green in colour.

Delivery was expedited when fetal heart rate abnormalities were detected by safest mode of delivery either by vaginal delivery or by caesarean section.

The APGAR score of neonates at 1 and 5 minutes, birth wt, NICU admission of all the neonates were recorded

RESULTS

1. INCIDENCE OF MECONIUM STAINED LIQUOR

Total no. of delivery during this period were 2250, of which 428 were meconium stained. Incidence of meconium stained liquor is 19%.

Table 1: SHOWING FREQUENCY OF DIFFERENT GROUP OF MECONIUM STAINED CASES (CLINICAL GRADING).

No. of cases	Normal deliveries		Caesarean section		
	No.	%	No.	%	
Thin meconium	325	114	35%	211	65%
Thick meconium	103	30	29%	73	71%
Total	428	144	29.85%	284	70.15%

Causes	CASES				P value
	Thin meconium		Thick meconium		
	No.	%	No.	%	
Hypoxic ischemic encephalopathy	98	23%	141	33%	<0.001
Meconium aspiration syndrome	89	21%	124	29%	<.001
Physiological jaundice	124	29%	214	50%	.017
Blood culture positive sepsis	73	17%	124	29%	.011
Convulsions	98	23%	141	33%	<.001
Pneumonia	73	17%	107	25%	.120
Pneumothorax	-	-	34	8%	.123
Meningitis	21	5%	34	8%	.121
Abnormal neurological examination at discharge	64	15%	68	16%	.013

This table shows that thin meconium had higher % of normal vaginal delivery 35% and thick meconium stained had higher % of Caesarean section 71%.

Table 3: SHOWING DIFFERENT CAUSES OF NEONATAL MORBIDITY

TABLE 4- MORBIDITY PATTERN IN GROUP DURING FOLLOW UP UPTO 6 MONTHS.

MORBIDITY	Study group
Cerebral palsy	7

Hearing deficit	3
Gastroesophageal reflux	2
Feeding difficulty with poor sucking	8
Pneumonia	6
Failure to thrive	2
Vision impairment	1
Mental retardation	7

DISCUSSION

MSAF is implicated as major factor influencing fetal well being. Presence of meconium in AF is considered to be of great concern to mid wives and Obstetrician. Passage of meconium was once thought to be sure sign of fetal death in utero (Schluz 1925) but later was realized to be sign of fetal hypoxia not actually fetal death (James Walker 1959¹. Meconium in AF during labour calls for close vigilance of fetal well being during labour.

The present study is done to evaluate NEONATAL OUTCOME IN MECONIUM STAINED LIQUOR.

It is a prospective clinical observational study. The present study was done from September 2014 to August 2015 on patients admitted in Obs & Gynae department of Dr Susheela Tiwari Government Hospital.

INCIDENCE:

Total no. of deliveries during study period were 2250, of which 428 were meconium stained cases which constitutes 19% incidence in present study similar in Goud and Krishna (1989)², Arun (1991)^{3,4,5,6}.

Age group:

Mean maternal age was 23.81 in present study. Similar study are Narlin et al^{7,8}. No influence of maternal age was seen on perinatal outcome of meconium stained cases.

PARITY DISTRIBUTION:

More cases of MSAF were found in primigravida (65.3%) as compared to Multigravida (36.7%) in present study. Similar study is Rosario et al.

BOOKING STATUS:

Unbooked cases are more associated with MSAF, 73.33% cases were unbooked whereas only 26.66 were booked.

Mode of Delivery:

Incidence of thin and thick MSAF (35% & 29%) in normal vaginal delivery and (65% & 71%) LSCS in present study. Similar study are Goud et al^{2,7}.

SEX DISTRIBUTION:

In this study incidence of male baby (62.66%) was higher than female (37.33%). Similar were the finding of Gupta et al⁹ in which male-female ratio was 1.1:1.

RISK FACTORS:

Prolonged labour was more common in present study MSAF (17.33%) cases. similar study are Meis et al¹⁰.

Hypertensive Disorder: In present study 17.33% similar study are Goud et al (15.75%)², Fujikura (11.2%)^{11,12}.

BIRTH ASPHYXIA:

In present study Incidence is 26.66% similar incidence was found in Meis et al¹⁰, Miller et al^{12,13,14}.

Incidence of severe birth asphyxia was present 15% and moderate birth asphyxia was 50% in thin meconium stained group whereas in thick meconium stained severe asphyxia was 30% and moderate birth asphyxia was 52% reported by APGAR score in one minute.

Incidence of severe birth asphyxia was present 5.88% and moderate birth asphyxia 19.6% in thin meconium stained group whereas in thick meconium stained severe birth asphyxia was 12% and

moderate birth asphyxia was 30% reported by APGAR score at 5 minute.

MECONIUM ASPIRATION SYNDROME:

Thick meconium cases had higher incidence (29.16 %) of Meconium Aspiration Syndrome in present study similar incidence in Naril n et al.⁷

Neonatal morbidity and Neonatal mortality:

Neonatal morbidity in present study (18.66%) similar study Debdas et al (10%)^{15,3}. Neonatal mortality in present study (18.66%), Debdas (6%)^{15,3,16}.

CONCLUSION

- Total number of deliveries during period was 2250, of which 428 were meconium stained.
- Overall incidence of meconium stained cases was 19%.
- Thin meconium cases was almost double of thick meconium cases.
- Mean gestational age was 39.6 weeks.
- Mean maternal age was 23.81.
- Primigravida had high no. of meconium stained liquor.
- Thin meconium cases had higher percentage of normal vaginal delivery (35.29%) as compared to thick meconium stained cases (29.16%).
- Thick meconium stained cases had higher percentage of caesarean section than thin meconium stained cases.
- 1 minute and 5 minute APGAR score were lower in thick meconium stained cases and meconium staining of amniotic had definite predictive value regarding low APGAR score and fetal outcome.
- Incidence of severe birth asphyxia was reported 5.88% and moderate birth asphyxia was 19.6% in thin meconium stained cases whereas in thick meconium severe birth asphyxia was 12% and moderate birth asphyxia was 30% reported by APGAR score at 5 minute.
- Neonates born with thick meconium had more academia, more need of ventilatory support and higher mortality than those born with thin meconium.
- Incidence of neonatal death and still birth was 18.66% and 5.33%.
- Most of centre in our country lack facilities for electronic fetal heart rate monitoring and fetal scalp blood studies, so meconium is the noninvasive easiest modality to see fetal distress. It is therefore necessary to reevaluate the importance of clinical methods and apply them to judge fetal hypoxia and prevent long-term sequelae.
- This study confirmed the clinical impression that meconium stained amniotic fluid adversely affects fetal outcome.

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