

Mode of Delivery in Meconium Stained Amniotic Fluid: A Descriptive Clinical Study

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Abstract

Introduction: Meconium is likely to cause both mechanical obstruction of the airways and chemical pneumonitis. The free fatty acids in meconium will strip away alveolar surfactant. Atelectasis, consolidation, pneumothorax and pneumomediastinum may occur that would prove to be fatal. *Methodology:* During study cases were selected with pregnant women at term gestation with cephalic presentation with meconium stained amniotic fluid, keeping in mind the inclusion and exclusion criteria. *Results:* 75 patients with thin meconium stained amniotic fluid, 34 (45.33%) had normal vaginal delivery, while in thick meconium stained amniotic fluid out of 125 only 36 (28.8%) delivered normally. *Conclusion:* Incidence of LSCS was more in thick meconium stained amniotic fluid as compared to with thin Meconium stained amniotic fluid

Keywords: Meconium; Amniotic Fluid; Mode of Delivery.

Introduction

Meconium aspiration remains the most significant cause of morbidity and mortality during neonatal period. The overall incidence of meconium aspiration in live born infants is 1 to 3%. Between 10 and 30% of meconium stained babies

develop varying degrees of respiratory difficulties (Brown 1981) [1].

Meconium is likely to cause both mechanical obstruction of the airways and chemical pneumonitis. The free fatty acids in meconium will strip away alveolar surfactant (Clark 1987) [2]. Atelectasis, consolidation, pneumothorax and pneumomediastinum may occur that would prove to be fatal. Meconium has definite toxic properties of a low grade nature, similar to those of bile, but is much more pronounced in their local effect. The pH of meconium ranges between 5.5-7.

Bacsik [3](1977) explained the pathophysiology of MAS as follows - Mechanical airway obstruction by particles of meconium or by squamous epithelial cells probably plays the most important role in the pathophysiology of MAS. A large amount of meconium is capable of completely obstructing the trachea, resulting in rapid death from asphyxia and acute corpulmonale. Smaller amount move quickly to the lung periphery resulting in obstruction of the distal airway resulting to atelectasis followed by hypoxia. Partial airway obstruction would produce a ball valve effect leading to trapping of air.

Infants of either meconium aspiration or staining showed a significant inflammatory response of lung tissue, but several infants with abundant intra-alveolar meconium showed no significant inflammatory response. Hyaline membranes were evident histologically in six of ten live born infants with meconium aspiration (Perlman 1989) [4].

The irritating action of meconium on the pulmonary parenchyma might initiate a chemical pneumonitis helping to

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compromise pulmonary function and this could explain the inflammatory changes seen histologically in infants dying of MAS, and partially explain the high incidence of effusion seen on chest X-ray.

Methodology

A prospective study of 200 cases of meconium stained amniotic fluid was studied at Teaching & General Hospital. During study cases were selected with pregnant women at term gestation with cephalic presentation with meconium stained amniotic fluid, keeping in mind the inclusion and exclusion criteria.

Methods of Collection of Data

A careful history is taken from all cases particularly about age, parity, gravidity and duration of labour. Previous obstetric history

Previous obstetric complications

A detailed clinical examination and appropriate investigations.

Inclusion Criteria

All pregnant women in labour with cephalic

presentation with singleton pregnancy with meconium stained liquor irrespective of age, parity and stage of labour.

Artificial rupture of membranes or spontaneous rupture of membranes.

Pregnancy induced hypertension

Previous normal deliveries and previous LSCS.

Exclusion Criteria

Malpresentation

Multiple pregnancies

Preterm and post-term pregnancy

Maternal medical diseases

Fetal malformation

Intrauterine fetal demise

Obstetric complications: Eclampsia, antepartum hemorrhage

Results

The data collected in this study is presented in the following tables as seen in 200 patients with meconium stained amniotic fluid.

Table 1: Incidence of MSAF

Total	MSAF	Percent
5075	704	13.87

Out of 5075 deliveries conducted, 704 i.e., 13.87% were meconium stained out of which 200 cases were selected for the present study which had inclusion

criteria.

Of the total number of 200 cases, 125 cases had thick meconium and 75 cases thin meconium.

Table 2: Relationship of maternal factors with Meconium Stained Amniotic Fluid

Maternal factors	No. of Deliveries	Percentage
PIH	33	16.50
Anemia	23	11.50
PROM	20	10.00
Non-progress of labour	6	3.00
Previous LSCS	21	10.50
Total	103	51.5%

Table 3: Incidence of gravidity in meconium stained amniotic fluid

Gravidity	Thin		Thick	
	No.	Percent	No.	Percent
Primi	45	60.00	83	66.40
Multigravida	30	40.00	42	33.60
Total	75	100.00	125	100.00

Out of 200 cases with Meconium stained amniotic fluid 103 cases i.e. 51.5% were associated with maternal complication (both antepartum and

intrapartum). Of these 33 were PIH (16.5%) followed by anemia 23 cases (11.5%), PROM - 10%, previous LSCS 10.5% and non-progress of labour in 3% of cases

because of non-progress of labour.

Incidence of thin meconium is more in primigravida 60.0% as compared to multigravida i.e., 40%. Incidence of thick meconium stained inprimigravida i.e., 66.4% as compared with

multigravida which is 33.6%. There was no difference in the type of meconium with respect to gravidity but overall incidence of meconium stained amniotic fluid was more in primi because period of gestation and duration of labour is more.

Table 4: Meconium first observed and mode of delivery in case of primi

Stage of labour when meconium detected	Type of meconium	No. of cases	Mode of delivery			
			NVD	Vaccum	Forceps	LSCS
Latent phase	Thin	13	5	--	--	8
	Thick	33	5	1	--	27
Active phase	Thin	20	10	4	--	6
	Thick	38	13	5	1	19
2 nd Stage	Thin	12	5	3	1	3
	Thick	12	5	4	1	2
Total		128	43	17	3	65

Table 5: Meconium first observed and mode of delivery in case of Multipara

Stage of labour when meconium detected	Type of meconium	No. of cases	Mode of delivery			
			NVD	Vaccum	Forceps	LSCS
Latent phase	Thin	11	1	--	--	10
	Thick	18	1	3	--	14
Active phase	Thin	9	8	--	--	1
	Thick	23	11	1	1	10
2 nd Stage	Thin	10	5	4	1	--
	Thick	1	1	--	--	--
Total		72	27	7	2	35

Table 6: Mode of delivery

Mode of delivery	Thin	Percent	Thick	Percent	Total	Percent
Vaginal delivery	34	45.33	36	28.8	70	35.00
Forceps assisted vaginal delivery	2	2.67	3	2.4	5	2.50
Vaccum assisted vaginal delivery	11	14.67	14	11.20	25	12.50
LSCS	28	37.33	72	57.60	100	50.00
Total	75	100.00	125	100.00	200	100.00

$\chi^2=26.089$

$p<0.001$ Highly significant

The number of emergency LSCS was more in primi, in whom, meconium was detected early in labour and was thick compared to thin and other stages of labour.

The number of emergency LSCS was more in multi, in whom, meconium was detected early in labour and it was thick compared to thin and other stages of labour. Trial of labour was shortened with cases of previous LSCS with MSAF as indication for LSCS

involved in both the conditions.

75 patients with thin meconium stained amniotic fluid, 34 (45.33%) had normal vaginal delivery, while in thick meconium stained amniotic fluid out of 125 only 36 (28.8%) delivered normally. Incidence of LSCS was more in thick meconium stained amniotic fluid i.e., 57.6% as compared to 37.33% with thin Meconium stained amniotic fluid.

Discussion

Table 7: Incidence of MSAF

Author	Incidence of MSAF (%)
Kamala G et al ⁵	9.37
Linder et al ⁶	10.40
Goud and Krishna ⁷	9.80
Arun ⁸	14.00
Hari Bhaskar ⁹	11.20
Present study ¹⁰	13.87

In the present study the incidence was 13.87%. Out of 5074 deliveries 704 cases had meconium stained,

among them 200 cases were randomly selected and studied.

Table 8: Comparative incidence of MSAF with Parity of Mothers

Parity	Kamala et al ¹⁰	Present study
Primi	54.00%	64.00%
2 nd Delivery	24.70%	25.50%
3 rd Delivery	18.00%	5.50%
4 th Delivery or more	3.30%	5.00%

Table 9: Comparative incidence of mode of delivery

Mode of delivery	Bhide SS et al ¹¹ (%)		Goud ⁷ (%)		Present study (%)	
	Thin	Thick	Thin	Thick	Thin	Thick
Normal delivery	59.22	49.29	86.48	66.66	45.33	28.28
Forceps	24.27	15.49	4.05	7.84	2.67	2.40
LSCS	16.50	35.21	1.35	21.56	37.33	57.6
Vacuum	--	--	5.49	3.92	14.67	11.20

Highest incidence of MSAF was seen in the primigravida i.e., 64%. According to above, present study was correlating with the study done by Kamala Ghokroo et al. More number of cases seen in primigravida i.e., 128 out of 200 cases.

There was increased incidence of operative delivery in our study.

Overall percentage of LSCS was high due to fetal distress as indicated by MSAF and non-reactive NST and is because of cases being referred from peripheral hospital. In the present study, LSCS indication was higher i.e., 57.6%.

Conclusion

Admission to delivery interval is important as well as stage of labour in deciding the mode of delivery and prevention of perinatal morbidity

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