

Study of antenatal and intrapartum risk factors associated with meconium stained amniotic fluid

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Abstract

Background: Meconium aspiration syndrome (MAS) is an important cause of morbidity and mortality among newborns in the developing world. Meconium stained infants are considered 100 times more likely to develop MAS, compared with infants born through clear amniotic fluid. Intrauterine passage of meconium has been linked to foetal hypoxia and acidosis, abnormal foetal heart tracing and low APGAR scores. **Aim and Objectives:** To study antenatal and intrapartum risk factors associated with meconium stained amniotic fluid. **Material and Methods:** It's a prospective observational study. The study population included all the babies born with MSAF in the tertiary care centre during study period of 2 years from Nov 2014 to Oct 2016. Standard definitions were followed for defining antenatal and intrapartum risk factors. **Results:** Incidence of deliveries with meconium stained amniotic fluid was 4.24%. Post datism is the most common risk factor for MSAF accounting for 51.48%. Pregnancy induced hypertension is the second most common risk factor (28.22%) followed by oligohydramnios and PROM. Among intrapartum risk factors, Prolonged labour (6.37%) being the most common risk factor followed by obstructed labour (4.75%). **Summary and Conclusions:** Incidence of MSAF varies with place to place in accordance with study population and availability of antenatal care facilities. Incidence of MSAF was much higher in post dated pregnancy.

Key Words: Foetal distress, Meconium.

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INTRODUCTION

Foetal well-being has traditionally been evaluated on the basis of foetal activity, foetal heart rate and presence of meconium in liquor amnii in vertex presentation. Meconium stained amniotic fluid is a frequent occurrence in neonatal practice during delivery. Incidence of meconium stained amniotic fluid ranges from 10-15% of all births.¹ It's more commonly seen in terms and post term

deliveries. Passage of meconium considered physiological exhibiting sign of foetal maturity on one hand and a sign of foetal distress a response to hypoxic insult on the other hand.² Meconium aspiration syndrome (MAS) is an important cause of morbidity and mortality among newborns in the developing world. Meconium aspiration syndrome (MAS) develops in 5% of infants born with meconium stained amniotic fluid (MSAF).¹ The etiology and pathophysiology of MSAF is poorly understood.³ The passage of meconium typically occurs within 48 hours after birth. However intrauterine passage of meconium has been linked to foetal hypoxia and acidosis, abnormal foetal heart tracing and low APGAR scores.⁴ Since all the babies with meconium stained amniotic fluid do not have adverse outcome, it is important to identify the babies requiring prompt treatment and to prevent meconium aspiration syndrome and its outcome.

MATERIAL AND METHODS

The present study is prospective observational study. The study population included all the babies born with meconium stained amniotic fluid in the tertiary care centre during study period of 2 years from Nov 2014 to Oct 2016. The study design and methodology was approved by the institutional ethical committee. Following a valid informed consent by relatives of eligible neonate, a detailed history was noted as per the predesigned and pretested proforma. Antenatal history was elicited from mother in retrospective manner to evaluate risk factors present for MSAF. Variables like maternal age, parity, booking status, weight and height, mode of delivery is noted. After analysis of case records, there were 15890 consecutive deliveries during this 2 year period of which 674 deliveries were having meconium stained amniotic fluid. All the babies meeting the inclusion criteria like neonates born at our tertiary care centre with meconium stained amniotic fluid included in the study while, those babies born outside the tertiary care centre, babies born with congenital anomalies, Intrauterine deaths, breech and multiple gestations (twins and more) also, babies with other than cephalic presentation were excluded from the study. On the basis of detail antenatal history, case records and from obstetrician opinion, maternal risk factors were taken into account. In this study antenatal risk factors like pregnancy induced hypertension (PIH), oligohydraminos, postdatism, prolonged rupture of membrane, eclampsia, hepatitis, anaemia were studied. All the babies were thoroughly examined to rule out other causes of distress in babies with meconium stained amniotic fluid. Standard definitions were followed for defining the risk factors in mother. The babies meeting the criteria for admission are admitted in NICU and managed as per the protocols.

RESULTS AND OBSERVATIONS

The total number of deliveries during the two year study period from Nov 2014 to Oct 2016 were 15980 out of which 674 had meconium stained amniotic fluid. Incidence was 4.24%.

Table 1: Incidence of meconium stained Amniotic fluid

Total Deliveries During Study Period	Deliveries With MSAF	Percentage
15890	674	4.24%

Table 2 shows sex distribution of total 674 babies, male babies (57.86%) were higher in number than female babies (42.14%).

Table 2: Percentage of sex distribution in babies born of MSAF

Sex Of The Baby	No. Of Cases	Percentage
Male	390	57.86
Female	284	42.14

Table 3: Maternal risk factors associated with MSAF

Risk Factors	Number of Cases	Percentage out of total women with risk factors
Post datism	104	51.48%
PIH	57	28.22%
Oligohydraminos	19	9.40%
PROM	10	4.96%
Anaemia	6	2.97%
Eclampsia	4	1.98%
Hepatitis	2	0.99%
Total	202	29.97%

Table 3 shows that out of 674 women, 202 women were having risk factors accounting for 30%. Post datism is the most common risk factor for MSAF accounting for 51.48%. Pregnancy induced hypertension is the second most common risk factor (28.22%) followed by oligohydraminos and PROM.

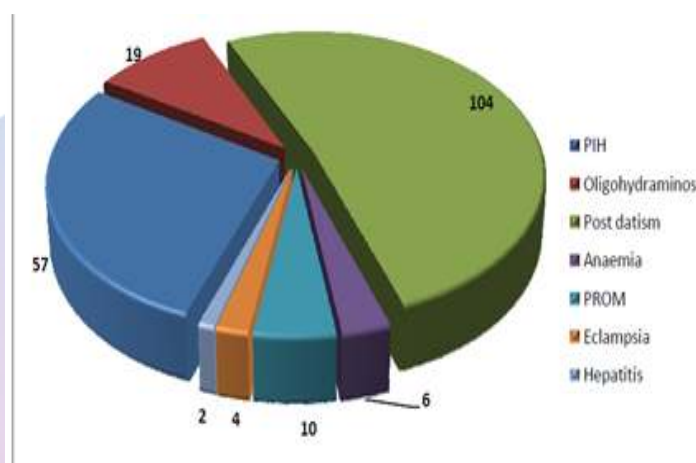


Figure 1: Distribution of cases of maternal risk factors associated with MSAF

Table 4: Incidence of foetal distress in babies born with MSAF

Total number of babies with MSAF	Babies with foetal distress	Percentage
674	212	31.45%

Table 04 shows significant number of babies were having antenatal foetal distress accounting for 31.45%

Table 5: Comparison of modes of delivery in babies born with MSAF

Mode of Delivery	No. Of Cases (N=674)	Percentage
Lscs	442	65.58%
Vaginal	232	34.42%

Above table shows higher percent of babies were born with lower segment caesarean section i.e. 65.5% while 34.5% babies were born out of normal vaginal delivery (assisted and spontaneous).

Table 6: Incidence of MSAF with respect to intrapartum risk factors

Complications during delivery	Number of cases	Percentage
Cord prolapse	12	1.78%
Obstructed labour	32	4.75%
Prolonged labour	43	6.37%
Total	87	12.90%

From Table no. 06, around 87 out of 674 deliveries were having intrapartum risk factors during delivery accounting for 12.9% of total deliveries. Table also shows out of 87 deliveries with intrapartum risk factors, Prolonged labour (6.37%) due to any reason account for most common risk factor followed by obstructed labour (4.75%).

DISCUSSION

Out of 15890 deliveries during study period, 674 babies were born with MSAF. Thus the incidence of MSAF was found to be 4.2 % in our study. Our results are similar to the study conducted by Shaikh EM *et al*³ in 2006 showing 4% incidence of MSAF in their study. Also, the study done by Supriya K *et al*⁵ in has results comparable with our study, their incidence being 6.1 %. In 2013, Manohar R *et al*⁶ in their study showed the incidence of MSAF as 20.1%. In our study out 672 babies born with MSAF, 390 were males whereas 284 babies were females. Thus, their respective percentages were 57 and 42 and there ratio being 1.3:1. Our results showed incidence of passage of meconium is more in males. Similar results were seen in study by Rajput U *et al*⁷ in 2012 where incidence was found to be more in male neonate (55%). The male-female ratio was 1.2:1. In our results, we found that 104 mothers i.e. 51.4% were post dated. Thus postdatism was found to be the major risk factor for MSAF. PIH was present in 57 mothers constituting 28% and its found to be the second major cause following post datism. 19 women were having oligohydraminos, 10 women were having PROM (4.9%) while, anemia and eclampsia was seen in very few women. Hepatitis was found to be least significant risk factor in our study. The Comparable results with regards to post datism seen in studies by Rokde Jet *et al*⁸ (2016) found to have 21%, Gauchan E *et al*⁹ (2014) had 46 % but statistically not significant, while in our study it was 51.4%. Regarding PIH, It was found to have 17.2% by Manohar Ret *et al*⁶ (2013), 28% by RokdeJ *et al*⁸ (2016), 52% by Parvin MI *et al*¹⁰ (2008). It was 27 % in our study. In our study it was found to have least association of MSAF with hepatitis i.e. only 0.9%. Studies by Meena Priyadarshani *et al*¹¹ (2012) found to have 3 % while, Gupta V *et al*¹² (1994) found to have significant association of hepatitis with MSAF. Foetal distress had significant association in determining the passage of

meconium. Comparable results with our study (31.45%) were found in the study done by Vora H *et al*¹³ (2014). They found that out of the 90 babies born with MSAF 20 i.e. 22.22% had antenatal foetal distress, of which 12 developed MAS i.e. 60%. Thus, antepartum foetal distress is higher in babies developing MAS. Gupta V *et al*¹² (1994) studied and found foetal distress in 24.5%. In our study, we found that out of 674 deliveries associated with MSAF, 442 deliveries were caesarean section (65.63%) while, normal vaginal delivered were 232 (34.4%). Rajput U *et al*⁷ (2012) found to have emergency cesarean section as common mode of delivery (83%). As opposite to our study Kumara R *et al*¹⁴ (2007) found to have 60% vaginal deliveries and 40% cesarean section deliveries associated with MSAF. While Gauchan E *et al*⁹ (2014) found no association with the mode of delivery. With regard to intrapartum risk factors, comparable results with our study were found from study by Gupta V *et al*¹² showing prolonged labor 4.4%, obstructed labor 2% and cord prolapse 1.5% among all babies with MSAF while, a study by Rajput S *et al*¹⁵ shows obstructed labour 7% and cord prolapse 6% of babies.

SUMMARY AND CONCLUSIONS

Incidence of MSAF varies with place to place in accordance with study population and availability of antenatal care facilities. Among the total number of deliveries, 674 babies were born with meconium stained amniotic fluid with an incidence of 4.2%. The percentage of male babies with MSAF was higher in our study. Post datism is the most common risk factor for MSAF followed by PIH and oligohydraminos. Significant number of babies with MSAF was having antepartum foetal distress. There was higher incidence of operative deliveries among babies born with MSAF. From our study, out of total deliveries with intrapartum risk factors, prolonged labour due to any reason account for most common risk factor followed by obstructed labour.

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