Original Research Article

Clinical profile and course of disease in babies with complications of meconium stained amniotic fluid

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Abstract

Background: 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. Meconium stained amniotic fluid (MSAF) occurs in approximately 8 to 25% of all deliveries, primarily in situations of advanced foetal maturity or foetal stress. **Aim and Objectives:** To study clinical profile and course of disease in babies with complications of 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.The babies meeting the criteria for admission are admitted in NICU and managed as per the protocols. **Results:** Incidence of deliveries with meconium stained amnioticfluid was 4.24%.Postdatism is the most common risk factor for MSAF accounting for 51.48%. Most common complication in babies born with MSAF was meconium aspiration syndrome (62.5%) followed by PPHN(42.04%). The incidence of meconium aspiration syndrome in babies with MSAF found to be 8.1% while, mortality due to MAS syndrome comes out to be 20%. **Summary and conclusions:** Incidence of MSAF varies with place to place in accordance with study population and availability of antenatal care facilities. Meconium aspiration syndrome is an important cause of morbidity and mortality among newborns in the developing world.
Key Words: Meconium, foetal distress.

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Email: kalavatijaju@gmail.com
Received Date: 18/08/2017 Revised Date: 20/09/2017 Accepted Date: 10/10/2017
DOI: https://doi.org/10.26611/1012425

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	Accessed Date: 15 November 2017

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]Its 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 stained amniotic fluid (MSAF) is a frequent occurrence in neonatal practice during delivery. 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.[3] Meconium stained infants are considered 100 times more likely to develop meconium aspiration syndrome (MAS), compared with infants born through clear amniotic fluid. Meconium aspiration syndrome is an important cause of morbidity and mortality among newborns in the developing world. It's classically has been defined as respiratory distress that develops shortly after birth, with radiographic evidence of aspiration pneumonitis and a history of meconium stained fluid. Intrauterine foetal gasping, mechanical airway obstruction, pneumonitis, surfactant inactivation, and damage of umbilical vessels all play roles in the pathophysiology of meconium aspiration.[4]

How to cite this article: Supriya Shankar Gotey, Kalavati Jaju. Clinical profile and course of disease in babies with complications of meconium stained amniotic fluid. *MedPulse International Journal of Pediatrics.* November 2017; 4(2): 32-35.
http://medpulse.in/Pediatrics/index.php

MATERIAL AND METHODS

The present study is a 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. Variables like maternal age, parity, booking status, weight and height, mode of delivery is noted. 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. It is important to monitor infants born through MSAF for any signs of respiratory distress for at least 24 hours. Diagnosis of MAS is based on the presence of respiratory distress in an infant born through MSAF, with no alternate cause for respiratory distress. Chest radiograph and blood gas analysis should be performed if necessary.[5]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 2014to Oct 2016 were 15980 out of which 674 had meconium stained amnioticfluid. 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: 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 2 shows sex distribution of total 674 babies, male babies (57.86%) were higher innumber than female babies (42.14%).

Table No.03 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 byoligohydraminos and PROM.

Table 3: Maternal risk factors associated with MSAF

Risk Factors	Number Of Cases	Percentage Out Of Total Women With Risk Factors
Postdatism	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 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: Incidence of complications in babies born with MSAF admitted in NICU

Complications	No. Of Cases (N=88)	Percentage
Birth asphyxia	23	26.13%
MAS	55	62.5%
HIE	11	12.5%
Septicemia	26	29.54%
PPHN	37	42.04%

Neonates from our study population developed the above complications either singly or in combination. Most common complication was Meconiumaspiration syndrome (62.5%) followed by PPHN i.e. Persistent pulmonary hypertension of the newborn (42.04%).Least common complication was HIE (Hypoxic Ischemic Encephalopathy). Of all the deaths in our study population, most babies developed one or more of the above complications. MAS with one or more of the above complications remained the commonest cause of death.

Table 6: Incidence of meconium aspiration syndrome in babies with MSAF

Total Babies With MSAF	No. Of Babies With MAS	Incidence	Mortality
674	55	8.1%	20%

Out of 674 babies born with meconium stained amniotic fluid, 55 babies were having meconium aspiration syndrome. Its incidence being 8.1%.Out of 55 babies diagnosed with meconium aspiration syndrome, 11 babies died. Hence mortality due to MAS syndrome comes out to be 20%.

Table 7: Mortality in the babies born with meconium stained amniotic fluid

No. of babies born with MSAF	No. of babies died	Percentage
674	15	2.22%

Out of 674 babies born with MSAF, 659 babies were discharged while, 15babies died accounting for 2.2% mortality rate.

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. Ourresults are similar to the study conducted by Shaikh EM *et al*[6] in2006 showing 4% incidence of MSAF in their study. Also, the study done by Supriya K *et al*[7] in has results comparable with our study, their incidence being 6.1 %. In 2013, Manohar R *et al*[8] in their study showed the incidence of MSAF as 20.1%. In our study out 672 babies born with MSAF, 390 were males whereas 284babies were females. Thus, their respective percentages were 57 and 42 and there ratio being 1.3:1. Our results showed incidence of passage of meconiumis more in males. Similar results were seen in study by Rajput U *et al*[9]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 postdatism. 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 J *et al*[10] (2016) found to have 21%,Gauchan E *et al*[11](2014)had 46 % but statistically not significant, while in ourstudy it was 51.4%. 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*[12] (22.22%).Gupta V *et al*[13] (1994) also studied and found foetal distress in 24.5% babies. In our study out of 88 babies admitted in NICU, many babies had one ormore complications. 55 babies were diagnosed to have MAS (62.5%) followed by PPHN seen in 37 babies (42.04%). Birth asphyxia, septicemia, HIE accounts for 26.13%, 29.54% and 12.5% (Table No. 05). The most common complication i.e. meconium aspiration syndrome (62.5%)in present study found to be in 40% babies of MSAF by Priyadarshani M *et al*[14] (2012) while, Rajput S *et al* [15](2016) in another study found it in 5% babies. The second commonest complication in babies born with MSAF in our study was PPHN i.e. Persistent pulmonary hypertension of the newborn (42.04%). Few other studies by Shaikh M *et al*[16](2015) found it in 20.8% while, Fischer *et al*[17](2013) found in 17% of babies. This variation in results of development of PPHN may be due to difference in guidelines for surfactant therapy whereby liberal use of surfactant in neonates with MAS was adopted in Fischer's study, which is known to reduce the development of pulmonary hypertension. In our study only 3 babies were given surfactant. Septicemia as a complication in our study was found in 29.54% babies comparable with study by Vora H *et al*[12] (2014)found to be in 30% babies. MAS was the major cause of mortality in the babies with MSAF in our study. Incidence of MAS was found to be 8.1%.Comparing results with other studies by Gauchan E *et al* [11] (8.4%), Parvin MI *et al*[18] (10%), Rokde J *et al* [10](5.5%) and in contrast to results of study by Khazardoost *et al*[19] (21.1%). Mortality rate due to MAS in our study found to be 20%. Mortality in MAS seen in various studies comparable to our study by Shaikh M *et al*[16] (19.4%), Gupta V *et al*[13] (22.2%),Gauchan E *et al*[11](14%) while, contrasting results observed in study by Supriya K *et al*[7](40%). In our study, mortality due MSAF is 2.2% which is comparable with the studies done by Manohar R *et al*[8] (2.6%) and ParvinMI *et al*[18] (4%) while Gupta V *et al*[13]foundmortality due MSAF to be 4.9%.

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 foetaldistress. Meconium aspiration syndrome is the most common complication of MSAF followed by Persistent pulmonary hypertension of the new born and septicemia. Least common complication was HIE (Hypoxic Ischemic Encephalopathy).Incidence of meconium aspiration syndrome was 8.1% among babiesborn with MSAF and is the most common cause requiring NICU admission. Mortality due to MSAF is 2.2 % while, due to MAS is 20%.

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Source of Support: None Declared
Conflict of Interest: None Declared