ORIGINAL RESEARCH PAPER
Volume - 9 | Issue - 7 | July - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF INCIDENCE OF MECONIUM STAINED AMNIOTIC FLUID AND FACTORS AFFECTING NEONATAL OUTCOME

Neonatology

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ABSTRACT

Aims And Objectives: To establish incidence of MSAF in relation to birth weight, maturity ,mode of delivery and sex of newborn. To detect incidence of meconium aspiration syndrome in babies with MSAF. To detect percentage of babies requiring active management in NICU. To decide incidence of other complications of meconium aspiration syndrome.

Materials And Methods: In this study 2000 consecutive deliveries observed at tertiary care center in Surat ,Gujarat. Babies who required some form of resuscitation or active but with signs of respiratory distress were shifted to neonatal intensive care unit. Babies without respiratory distress and who were active at time of birth were shifted to mother side , breast feeding established and immunized .

Observation And Analysis: Out of 2000 deliveries 64 were still birth and 1936 were live births. MSAF seen in 12.21% of Male child and 8.54% of female child. Incidence of MAS is 83.3% when baby is depressed as compared to 3.49% when baby with MSAF was active at birth.61.81% of babies with five minute APGAR score < 6 developed MAS as compared to 38.19% with APGAR of >7. From 203 babies with MSAF 34.48% required active intervention in NICU. Out of 55 babies with MAS 21.82% required mechanical ventilation.

Conclusion: In present study incidence of MSAF is 10.4%.There is no significant association between birth weight and presence of MSAF. Incidence of MSAF increases with maturity. We found increased association between male sex and MSAF. Incidence of MAS is 27.09%.Mortality in MSAF is 2.95% and MAS is 10.9%.

(MAS=Meconium aspiration syndrome,MSAF=Meconium stained amniotic fluid,)

KEYWORDS

MAS, MSAF, Incidence

INTRODUCTION:-

The presence of meconium stained amniotic fluid (MSAF) is a serious sign of foetal compromise, which is associated with an increase in prenatal morbidity.[1,2] In earlier days, early amniotomy with active management of labour was done to detect meconium passed during labour.[3] Amniotomy in labour is also commonly performed to detect meconium where foetal heart rate is unsatisfactory.[4] If meconium stained amniotic fluid (MSAF) is found, then continuous foetal heart rate monitoring is required for foetal well being.[5]The exact aetiology of MSAF remains unclear.[6,7]Previous studies have demonstrated that the incidence of MSAF rises with gestational age. A study by Mathews and Warshaw[8] found that in 98.4% of cases with meconium stained liquor, the neonates were admitted to the neonatal intensive care units, these were delivered at 37 weeks of gestational age or later as it shows maturation of autonomic nervous system. Aspiration of meconium during intrauterine life may result in or contribute to meconium aspiration syndrome (MAS), representing a leading cause of perinatal death.[9] Meconium stained liquor may be aspirated during delivery resulting in neonatal respiratory distress syndrome.[10]The incidence of admission to newborn intensive care unit with, respiratory distress syndrome, meconium aspiration syndrome,[11] neonatal asphyxia,[12] chorioamnionitis,[13] foetal distress or foetal acidosis[1,4] were higher in pregnancies complicated by meconium stained liquor.

AIMS AND OBJECTIVES:-

To assess incidence of meconium stained amniotic fluid. To detect any relation between weight of the newborn , maturity of the newborn , sex of the newborn and parity of the mother with presence of MSAF. Relation of presence of MSAF with maternal factors like PIH, Eclampsia , PROM.To study association of signs of fetal distress(like fetal bradycardia or fetal tachycardia) with presence of MSAF.To study importance of status of baby at birth(depressed or active) regarding development of MSAF. Detect factors affecting development of meconium aspiration syndrome in babies with MSAF. Among babies with MSAF to detect percentage of babies who require active management in NICU & further interventions like mechanical ventilation. To decide the incidence of complications.

MATERIALS AND METHOD:-

This study was done at tertiary care hospital at Surat and 2000 consecutive deliveries were studied. For calculating incidence of MSAF we have included all the presentations including breech deliveries. We obtained name of mother, age, registration no, parity, h/o ANC etc. Presentation of foetus , meconium stained liquor were also entered. The baby was considered as born through MSAF when there was staining of body parts, umbilical cord and placenta with meconium. All 2000 patients during the study were managed according to NRP guideline, babies with MSAF just classified into meconium depressed and active groups and managed accordingly. Also active babies with some degree of respiratory distress were shifted to NICU for observation & further management. Weight ,maturity, sex all this criteria also included. In each & every patient APGAR was counted at 1min & 5min , if 5min APGAR was <7 then also APGAR at 10min & 20mins considered. All babies were observed for development of signs and symptoms of respiratory distress and X-ray chest after 6hrs of birth in each case with increased respiratory rate.

We also observed babies for development of other complications like vomiting due to meconium gastritis, hypoxemic ischemic encephalopathy, pneumothorax,Septicemia, Metabolic acidosis, Severe persistent pulmonary hypertension.

Qualitative data were presented as percentages and compared using Chi Square.

RESULTS AND DISCUSSION-

From 2000 deliveries observed, 64 were still birth and from remaining 1936 live births , 203(10.48%) babies born with meconium stained amniotic fluid. Incidence of MSAF varies in different studies. In study done by Punkaj Kumar Bhusan et all[16] incidence was 10%.In study done by national neonatal perinatal database 2002-2003[17] incidence was 8.4% of all live births in study done by Narang et all incidence was(7.48%)[18]. MSAF was more common when babies weight was between 2000 to 3000 grams. The total number above 3k.g. is 260 out of 1936 that is 13.04%.Also in <1500gms and 1500gms – 1999gms weight it is 4.8% and 8.4% respectively. Table-1

Table-1 Association Between Weight Of The Babies And MSAF

Weight in Grams	<1500	1500 to 1999	2000 to 2499	2500 to 3000	>3000	Total
Total babies	94 (4.8%)	164 (8.4%)	700 (36.15%)	718 (37.08%)	260 (13.4%)	1936
MSAF	0	08 (4.87%)	80 (11.42%)	101 (14.06%)	14 (5.38%)	203

By international agreement low birth weight is defined as a birth weight of < 2.5k.g. So, when made into two groups such as <2.5k.g. and ≥2.5.g., P is >0.05, difference between <2.5k.g. and ≥2.5k.g. is statistically insignificant. As the gestational age increases, there is very high chance of the baby to be born with MSAF. Out of the total deliveries 75% babies with maturity over 40wks of gestation , has MSAF as compared with 16.02% in 38-40wks and 8.4% in 36-38wks of gestation category respectively. When total number of MSAF is considered , there are more number of babies in 38-40 wks category that is 95 out of 203(46.79%),Table 2.

Table2 Association Between Gestational Age And MSAF

Maturity in weeks	>40wks	38–40wks	36–38wks	<36wks	Total
NoMSAF (1733)	10	498	846	389	1733
MSAF (203)	30(75%)	095(16.02%)	078(8.4%)	0	0203
Total (1936)	40	593	924	389	

In the study by Erun Malid Sheikh et al[19] there were 16% post date deliveries in subjects with meconium stained amniotic fluid and 1% post date delivery in subjects with clear liquor group.There is increased chance of a baby to be born with MSAF as the mother's parity increases. Out of the total deliveries 1936 , mothers with parity V had given birth to 23.87% of MSAF newborns, the highest. Table 3

Table 3 Association Between Parity And MSAF

	I	II	III	IV	≥V
Total No (1936)	700 (36.15%)	600 (30.99%)	370 (19.11)	155 (8%)	111 (5.73%)
MSAF Total (203)	38 (5.43%)	58 (9.67%)	62 (16.75%)	33 (21.29%)	12 (10.8%)

In the present study , we have also found that there is statistically significantly association between the chance of MSAF and male sex of the fetus Table 4.

Table 4 Association Between Sex Of Baby And MSAF

Total	Male	Female
No MSAF (1733)	898	835
MSAF 203	125	78

In study done in national neonatal perinatal database[17] also there is significant association between Male sex of foetus and incidence of MSAF.

In study done in National neonatal perinatal database[17] there is higher incidence of MSAF with foetal heart rate abnormalities like foetal bradycardia or foetal tachycardia in present study also there is statistically significant association between foetal heart rate abnormalities and chance of developing MSAF. Table 5

Table 5 Foetal Heart Rate Abnormality And Association With MSAF

Fetal distress	MSAF(203)	No MSAF(1733)
Bradycardia(<120)	26(12.8%)	50(2.88%)
Tachycardia(>160)	6(2.95%)	13(0.75%)
Normal(120-160)	171(84.23%)	1670(96.36%)

For fetal bradycardia p value is 0.0001.For fetal tachycardia p value is 0.0083.Both is statistically significant

In study done by Erun Majid et all[19] PROM is one of risk factors for MSAF.In our study there is significant association between MSAF and PROM.In national neonatal perinatal database[17] there is significant association between PIH , Eclampsia and incidence of MSAF in our study also there is statistically significant association between MSAF and maternal complications like PIH and Eclampsia Table 6.

Table 6 Association Between Maternal Complications Like PIH, Eclampsia, PROM and MSAF

Complications	MSAF	NoMSAF
PIH	20	80
Eclampsia	6	11
PROM	10	35

The chance of developing MAS out of the total MSAF that have been followed up in the study was only 26% .This indicates that 74% had MSAF as a part of physiological response because of increased maturity. In the present study , when apgar score at 1 min and chance for MAS was considered among 1 to 3 scored group 80% developed MAS , in 4 to 6 scored group 44.44% , in 7 to 10 scored group 27% , developed MAS. When they are grouped into <6 and >7 scored groups, < 6 scored group constituted MAS developed babies 40 out of total 55 . The rest of the total MAS were constituted by the group with apgar scores > 7 which is clinically significant. These findings indicate that there is high chance of developing MAS in babies born through MSAF and with apgar at 1 min < 6 with p value of 0.0061.Table 7.But the score > 7 does not rule out the chance of developing MAS because MAS starts as an intrauterine event.For statistical analysis , made into two groups such as apgar ≤ 6 and ≥ 7 , because the numbers are very less in ≤ 3 group.

Table 7 Association Between Low Apgar And MAS

Apgar Score	MAS developed	MAS not developed
≤6	40	74
≥7	15	74

In other studies such as Narang and Nair P.M.C. [18]observed that the incidence of MAS was very high in babies with low apgar scores in spite of endotracheal suctioning which give credence to the theory that the incidence of MAS is predominantly an intrauterine event which occurs in response to continued foetal gasping in a hypoxic environment.

In present study out of total 203 babies with MSAF 70 babies required NICU admission incidence is 34.48%.In study done by Erum Majid Sheikh et all[19] out of 250 babies with MSAF 165 required NICU admission. Incidence was 63%.The cause for higher NICU admission in that study may be due to higher incidence of MAS 115(46%) as compared to our study in which incidence of MAS 55(27.09%).Among 70 babies who admitted in NICU 55 required some form of oxygen support from 55, 12 babies required mechanical ventilatory support. In present study 4 babies got pneumothorax (1.9%), Signs of sepsis is in 33(16.25%), HIE in 14(6.8%) and repeated vomiting in 32(15.76%). Mortality is 6 out of 203 babies with MSAF which is 2.95%.3 expired due to HIE stage 3 and septicemia and one expired due to septicemia with MAS with pneumotharax and 2 expired due to severe septicemia with DIC with MAS.

CONCLUSION:-

Incidence of MSAF in the present study is 203 out of 1936 live births. There is increased incidence of MSAF as the gestational age of the foetus increases. There is increased association of MSAF as maternal parity increases. There is increased association of male sex and chance of developing MSAF. There is significant association between MSAF and foetal heart rate variabilities like foetal tachycardia or foetal bradycardia. There is increased incidence of MSAF with maternal complications like PIH , PROM and Eclampsia. There is increased incidence of MAS in depressed babies at birth as compared to active babies. Lower 5min APGAR score has significant association with chance of developing MAS. Out of 203 babies 55 developed MAS.

REFERENCES:-

1. Berkus MD, Langer O, Samuelloff A, Xenakis EM, Field NT, Ridgeway LE. Meconium stained amniotic fluid: increased risk for adverse outcome. Obstet Gynecol 1994; 84: 115-20.
2. Nathan L, Leveno KJ, Camody TJ 3rd, Kelly MA, Sherman ML.

Meconium: a 1990s perspective on an old obstetric hazard. Obstet Gynecol 1994; 83:329-32.
3. Clinical Effectiveness Support Unit. The use of electronic fetal monitoring. Evidence-based clinical guideline no. 8. London: RCOG Press, 2001. (Online) Cited 2003 May 19. Available from URL: kl=lko0. uk/pdf/efmguidelinercog.pdf.
4. Goffinet F, Fraser W, Marcoux S, Breart G, Moutquin JM, Daris M. Early amniotomy increases the frequency of fetal heart rate abnormalities. Amniotomy Study Group. Br J Obstet Gynaecol 1997; 104: 548-53.
5. Miller FC, Sacks DA, Yeh SY, Paul RH, Schirfin BS, Martin CB Jr, et al. Significance of meconium staining during labor. Am J Obstet Gynecol 1975;122:573-80.
6. Ghidini A, Spong CY. Severe meconium aspiration syndrome is not caused by aspiration of meconium. Am J Obstet Gynecol 2001; 185: 931-8.
7. Katz VL, Bowes WA Jr. Meconium aspiration syndrome: reflections on a murky subject. Am J Obstet Gynecol 1992; 166: 171-83.
8. Matthews TG, Warshaw JB. Relevance of the gestational age distribution of meconium passage in utero. Pediatrics 1979; 64: 30-1.
9. Ahanya SN, Lakshmanan J, Morgan BL, Ross MG. Meconium passage in utero: mechanisms, consequences, and management. Obstet Gynecol Surv2005;60:45-56.
10. Steer PJ, Danielian P. Fetal distress in labour. In: James OK, Steer PJ, Weiner CP, Gonick B (eds). High risk pregnancy 2nd ed. New York WB Saunders Company 2000; pp 1135-40.
11. Rao S, Pavlova Z, Incerpi MH, Ramanthan R. Meconium stained amniotic fluid and neonatal morbidity in near term and term deliveries with acute histologic chorioamnionitics and/or funisitis. J Perinatol 2001; 21: 537-40.
12. Pi PX, Zhu FF, Huang J. [Meconium stained amniotic fluid and intraamniotic infection]. Hunan Yi Ke Da Xue Bao 2003; 28: 648-50.
13. Connolly TP. Meconium stained amniotic fluid (MSF). Am J Obstet Gynecol 2004; 191: 2175-6.
14. Meharban Singh Care of the newborn Seventh Edition
15. Working Definitions. National Neonatal Perinatal Database of India; 2001.
16. Pankaj Kumar Bhushan et al,Observation of meconium aspiration syndrome and its correlation with gestational age and outcome.Available on http://www.pediatriconcall.com/for doctor/conference_abstracts /BIHAR_ PEDICON/meconium_aspiration_syndrome.asp
17. National neonatal perinatal Database 2002-2003 Meconium aspiration syndrome.
18. A. Narang,P.M.C. Nair,O.N.Bhakoo,K.Vashisht,Management of meconium stained amniotic fluid: A team approach,Indian Pediatrics,Jan-1993,30:9-13
19. Erum Majid Shaikh,Sadaf Mehmood,Majid Ahmed Shaikh,Neonatal outcome in meconium stained amniotic fluid-one year experience,JPMA 2010;60:711