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Attributes & Perinatal Outcome in Deliveries With Meconium Stained Amniotic Fluid

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ABSTRACT

Objectives- To study antenatal and peripartum attributes of meconium stained amniotic fluid (MSAF) and its effect on perinatal outcome.

Methods- It is a prospective observational case control study done in department of Obstetrics & Gynaecology, Shyam Shah Medical College, Rewa (M.P.). A total of 300 women fulfilling inclusion criteria were included in the study. Women were divided into two groups: 150 women with MSAF as cases and 150 women with clear liquor (non MSAF) as control. They were enquired about various risk factors and its effect on perinatal outcome.

Results- Around 80% of subjects belonged to age group 21-29 years in both case and control groups and most were primipara. Amongst cases 41.2% of cases had gestational ages of more than 40 weeks, whereas in control group it was 7.9%. Caesarean section was done in 23.3% MSAF cases. Pregnancy induced hypertension (PIH) was present in 24%, post maturity in 41.2%, obstructed labour in 8% and prolonged labour with prelabour rupture of membrane in 13.2% of MSAF cases. Infants with MSAF had statistically higher neonatal complications as compared to those born to control group. 18.7% infants with MSAF cases needed intensive care unit admissions. Still birth and early neonatal deaths was found in 13.3% cases. Among cases 4% babies developed Meconium aspiration syndrome (MAS)

Conclusion- Meconium stained amniotic fluid is associated with increased incidence of caesarean section, birth asphyxia, neonatal nursery admissions and MAS.

KEYWORDS Antenatal factor, Intrapartam factor, Meconium stained amniotic fluid

INTRODUCTION-

The presence of meconium stained amniotic fluid (MSAF) is a serious sign of foetal compromise, which is associated with an increase in perinatal morbidity [1,2], clear amniotic fluid on the other hand is considered reassuring. Presence of MSAF is seen in 12-16 % of deliveries[3]. In-utero, passage of meconium may simply represent the normal gastrointestinal maturation or it may indicate an acute or chronic hypoxic event, thereby making it a warning sign of a foetal compromise. Meconium passage is rare before 34 weeks of gestation and incidence increases steadily beyond 37 weeks of gestation [4]. Factors such as placental insufficiency, maternal hypertension, pre-eclampsia, oligohydramnios or maternal drug abuse (tobacco, cocaine) result in in-utero passage of meconium [5].

Infants born through MSAF are about 100 times more likely to develop respiratory distress than those which are born through clear fluid [6]. Even in women who are at very low risk for obstetric complications, MSAF is common and it is associated with a five-fold increase in perinatal mortality as compared with low-risk patients with clear amniotic fluid [3]. Presence of meconium below vocal cord is known as meconium aspiration and it is seen in around 20-30 % of all infants with MSAF [7]. Aspiration can occur in-utero with foetal gasping, or after birth, with the first breaths of life. Meconium aspiration syndrome (MAS) is defined as a respiratory distress that develops shortly after birth, with radiographic evidence of aspiration pneumonitis and presence of MSAF [8]. MAS occurs in about 5% of deliveries with MSAF [7] and death occurs in about 12% of infants with MAS [9].

Taking the risks of MSAF into consideration, this study has been done with an aim to compare the foetal outcome in deliveries complicated by meconium staining versus clear liquor and also to critically evaluate the associated maternal factors.

MATERIAL & METHODS

This is a prospective, analytical, case-control study of 300 women admitted to the labor ward with MSAF (cases) and clear liquor (control) between July 2013 and August 2014.

The cases were selected randomly. The inclusion criteria were meconium stained amniotic fluid diagnosed by spontaneous / artificial / intraoperative rupture of membranes, singleton pregnancy, and cephalic presentation. The exclusion criteria were antepartum hemorrhage, multifetal gestation, presentation other than cephalic and congenital fetal anomalies.

Foetal heart rate (FHR) monitoring was done with intermittent auscultation only. If meconium was detected in liquor after artificial rupture of membranes then more frequent auscultation (every 15 minute) was done. Mode of delivery was decided after considering all obstetrical conditions. The live births were then categorized into MSAF and non-MSAF groups and compared for variables like maternal age, parity, antenatal complications (antepartum hemorrhage, pregnancy induced hypertension, eclampsia, *etc.)* and complications during labor (obstructed or prolonged labor, fetal distress). In vigorously crying neonates, no active intervention was done and they were carefully observed for development of any respiratory distress subsequently where as intratracheal intubation and suctioning was done to suck out thick/thin meconium in a depressed infant at birth as per NRP protocol. The fetal outcome was evaluated on condition of neonate i.e.; Apgar score, admission in nursery and still birth. Amnio-infusion can be used to prevent foetal distress due to meconium stained amniotic fluid [10] and it was done wherever required.

All data was entered in SPSS version 10 to analyze through its statistical programme. Chi-square with Yate's correction were used to test the statistical significance of the results.

RESULTS

A total of 300 women fulfilling all the inclusion criteria were included in the study. Women were divided into two groups: 150 women with MSAF as cases and 150 women with clear liquor (non MSAF) as control. Most of the women were primipara and around 80% women belonged to age group 21-29 years in both case and control groups. [Table I]

41.2% cases had gestational ages of more than 40 weeks in case group as compared to 7.9% control ($p < 0.01$), suggesting that advancing gestation increases meconium staining of amniotic fluid [Table III]. Caesarean section was done in 23.3% MSAF cases as compared to 5.3% cases in control group, rate difference being statistically significant ($p < 0.0001$). 6.7% cases had instrumental deliveries as compared to 2% cases among controls, ($p < 0.02$) [Table IV]. Pregnancy induced hypertension (PIH) was alsopresent in 24% of cases which was also significant.

Cases having MSAF had higher incidence of intrapartum complications e.g. 8% cases had obstructed labour, 13.2% had prolonged labour & pre labour rupture of membranes ($p<0.0005$) and; 4.67 % cases had foetal heart rate abnormalities and foetal bradycardia which was statistically higher in cases as compared to that in controls.

Neonates of 18.7% cases needed intensive care unit admissions in comparision to non MSAF group ($p<0.0005$). Birth asphyxia was seen in 8% (n=12) and Still birth/ early neonatal deaths was found in 13.3% (n=20) babies had who were born to mother with MSAF. Among cases 4% babies developed MAS [Table VI]

DISCUSSION

Meconium stained amniotic fluid (MSAF), is a commonly observed phenomenon. The presence of thick meconium is associated with increased incidence of perinatal morbidity and mortality. We found that the incidence of MSAF was higher in the age group of 20-30 years, and around 63.3% were primipara, which is similar to the studies done by Sandu SS et al[11] but was not statistically significant so we can say that maternal age and parity did not influence MSAF.

In our study there were 41.2% post dated deliveries amongst MSAF cases and it was 7.9% in non MSAF group ($p<0.0001$), In post term pregnancies the incidence varies from 28- 52% [12]. The incidence of MSAF among preterm was 4.67% in our study. Our findings closely resemble with those of Scott & Walker, [13] who reported the incidence of meconium stained amniotic fluid to be 5% in preterm delivery.

It is not uncommon for obstetricians to be more aggressive in labours with meconium stained amniotic fluid leading to higher caesarean section rate, which was 23.3% in our study. In contrast the caesarean section rate in the clear liquor group was 5.3% ($P < 0.0001$). Saunders et al [14] reported that caesarean sections were performed twice as frequently in subjects with meconium stained amniotic fluid, the higher rate may be due to lack of facilities such as, foetal scalp PH monitoring and tracings of foetal electronic monitoring[14]. Prolonged labour and prolonged rupture of membranes is also a risk factor for the passage of meconium(13.2% v/s 2% , $p< 0.005$), similar results were given by Saunder et al [14] who showed that prolonged labour is associated with worst outcome in MSAF group.

Scott et al [13] reported the same incidence of admission to neonatal intensive care unit as in our study (18.7 % v/s 2.6%; $P <0.0005$). Sood et al [15] also showed a high incidence of meconium aspiration syndrome 4% as in our study (p 0.03). The neonatal death in a patient with MSAF was 13.3%. The rate of neonatal asphyxia in the meconium stained cases was significantly higher than that without meconium. Early amniotomy could be beneficial in post dated pregnancies complicated by abnormal foetal heart rate patterns or pregnancies complicated by other high risk factors. Prevention of MSA can be achieved by avoiding post maturity, as decreased term of gestation reduces perinatal mortality.

CONCLUSION

Meconium stained amniotic fluid is really worrisome from both obstetrician's and paediatrician's point of view. Based on our study we conclude that meconium stained amniotic fluid is associated with increased incidence of caesarean section, birth asphyxia, neonatal nursery admissions and meconium aspiration syndrome (MAS). So, presence of MSAF requires intensive foetal monitoring in order to decrease perinatal morbidity and mortality.

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SKP and KV collected the data and followed the cases and written the first draft of manuscript. NB, JS and HPS conceived and supervised the study and finalized the manuscript and will be the guarantors.

TABLE
IAGE GROUPS

Age group (years)	MSAF	NON-MSAF	P value
15-20	15 (10%)	13 (8.67%)	0.8427
21-29	120 (80%)	124 (82.6%)	0.5506
>30	15 (10%)	13 (8.67%)	0.8427

TABLE II
RELATION OF MSAF WITH PARITY

Parity	MSAF	Non MSAF	P value
P_1	95 (63.3%)	112 (74.7%)	0.04
P_2	32 (21.3%)	27 (18%)	0.56
P_3	12 (8%)	8 (5.3%)	0.48
$> P_4$	6 (4%)	3 (2%)	0.49

TABLE III
RELATION OF MSAF WITH GESTATIONAL AGE

Gestational age (week)	MSAF	NON- MSAF	P value
< 37	7 (4.67%)	14 (9.3%)	0.1746
37-40	71 (47.3%)	124 (82.6%)	<0.0001

40-41	44 (29.3%)	8 (5.3%)	<0.0001
41-42	16 (10.6%)	4 (2.6%)	<0.010
>42	2 (1.3%)	0	0.4780

TABLE IV
MODE OF DELIVERY IN RELATION TO MSAF

Mode of delivery	MSAF	NON MSAF	P value
VD	105 (70%)	140 (92.7%)	<0.0001
LSCS	35 (23.3%)	8 (5.3%)	<0.0001
Instrumental delivery	10 (6.7%)	3 (2%)	<0.02

TABLE V
RELATIONS OF ANTENALTAL & INTRAPARTUM COMPLICATIONS WITH MSAF

Complications	MSAF	NON MSAF	P value
Pregnancy induced hypertension	36 (24%)	2 (1.3%)	<0.0001
Post maturity	62 (41.2%)	12 (7.9%)	<0.0001
Oligohydramnios	9 (6%)	3 (2%)	0.14
IUGR	2 (1.3%)	0	0.47
Obstructed labour	12 (8%)	0	<0.001
PROM & prolonged labour	20 (13.2%)	3 (2%)	<0.0005
Fetal distress	7 (4.67%)	0	<0.02

TABLE VI
NEONATAL OUTCOMES

Neonatal outcome	MSAF	NON-MSAF	P value
Still birth	20 (13.3%)	2 (1.3%)	0.0002
Admission to NICU	28 (18.7%)	4 (2.6%)	<0.0005
Birth Asphyxia	12 (8%)	3 (2%)	0.03
MAS	6 (4%)	0	0.03

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