CRITICAL EVALUATION OF MECONIUM STAINING OF AMNIOTIC FLUID AND FOETAL OUTCOME

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SUMMARY

A prospective study of 50 patients in labour with meconium stained amniotic fluid (MSAF) with or without foetal heart variation have been evaluated in relation to the degree and duration of meconium stain as a criterion for intervention or not.

INTRODUCTION

Significance of meconium staining of amniotic fluid in cephalic presentation is still controversial. Few still consider it as a sign of foetal distress while others do not. *Miller et al (1975)* state, "Presence of meconium in amniotic fluid without foetal heart rate variations or foetal acidosis is not a sign of foetal distress and need not be an indication for active intervention." *Leonard (1962)* stated that if meconium stained amniotic fluid (MSAF) alone is considered as an indicator of intervention then 42% extra caesareans would be necessary but thick meconium with foetal heart rate variations should be viewed with concern.

Fifty cases of MSAF have been followed stringently during labour and perinatal outcome noted in relation to degree of meconium stain, duration of meconium staining with or without foetal heart variations, to arrive at inference whether MSAF with or without foetal heart variations need alone be taken as a criterion for intervention or not.

MATERIAL AND METHOD

50 cases of MSAF with cephalic presentation were studied. Colour of amniotic fluid and degree of meconium was noted at the time of amniotomy or spontaneous rupture of membrane and at the time of delivery. The duration between detection of meconium and time of delivery was noted - whether it was less than 1 hour, 1-3 hours or 3-6 hours. Patients were carefully examined for any antepartum or intrapartum risk factors like toxaemia, APH, IUGR, postdatism, prolonged labour, malpositio or premature rupture of membranes. The patients were clinically monitored during lab Criteria for foetal heart rate variation wr

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Accepted for Publication on 22.04.1993.

tachycardia and bradycardia. Depending upon degree of meconium, foetal heart rate variations and stage of labour and other risk factors, the time and mode of delivery was decided. After delivery condition of placenta was noted. Foetal well being was assessed by apgar score at 1 minute and 5 minutes. Babies were carefully followed up in the neonatal period for 7 days for any morbidity or mortality. The morbidity criterion was taken as meconium aspiration syndrome, chest infections and fever.

Depending upon the nature of meconium all patients were divided into three groups :

- Thin meconium
- Moderate meconium
- Thick meconium

RESULTS

Among 50 cases with MSAF 23 cases had thin meconium, 12 had moderate and 15 had thick meconium stained amniotic fluid. Duration of meconium staining varied from less than 1 hour to 6 hours. It was less than 1 hour in 22 cases, 1-3 hours in 18 cases and 3-6 hours in 10 cases.

80% cases were in the age group of 21-30 years, 8% cases were less than 20 years and 12% were more than 31 years old. 38% cases were primigravida and 62% cases were multigravida. 24% cases had other associated antepartum or intrapartum risk factors and 14% cases were post mature.

21.7% cases of thin MSAF, 33.3% of moderate MSAF and 46.6% of thick MSAF had foetal heart rate variations.

In patients with thin and moderate MSAF of any duration, all the babies cried immediately after birth and did not show any sign of asphyxia. None of these babies had low apgar score (less than 6) at one minute and 5 minutes. While in patients with thick MSAF 2(13.3%) babies had low apgar score (less than 7) at 1 minute and 1 baby (6.6%) had low apgar score at 5 minutes and there was one still birth.

Table I

Effect of duration and density of meconium staining on feotal outcome

Duation of meconium staining	Density of meconium	Total No. of cases	No. of cases with foetal heart rate variation	No. of babies with		
				Low apgar	Perinatal mortality	Morbidity
1 hour	Thin	8	1 (12.5%)	Nil	Nil	Nil
	Moderate	7	1 (14.3%)	Nil	Nil	Nil
	Thick	7	1 (14.3%)	Nil	Nil	3(42.8)
1 -3 hours	Thin	8	3 (37.5%)	Nil	Nil	Nil
	Moderate	4	2 (50%)	Nil	Nil	Nil
	Thick	6	4 (66.6%)	1(16.6%)	2(33.3%)	4(66.6%)
3-6 hours	Thin	7	1 (14.3%)	Nil	Nil	1(14.3%)
	Moderate	1	1 (100%)	Nil	Nil	1(100%)
	Thick	2	2 (100%)	1(50%)	1(50%)	1(50%)

Table II

Mode of delivery in 50 cases of MSAF

Mode of delivery	Meconium		
	Thin	Moderate	Thick
1 Normal vaginal delivery	18 (78.5%)	8 (66.6%)	4 (26.6%)
2 Forceps	2 (8.9%)	1 (8.4%)	5 (33.3%)
3 LSCS	3 (13.6%)	3 (25.0%)	6 (40.0%)
Total	23	12	15

LSCS were done either for bradycardia or other obstetrical indications

In patients with moderate and thin MSAF neonatal mortality was nil and morbidity was 2(5.7%).

Over all perinatal mortality was 6% and morbidity was 20%. Incidence of LSCS was more in the group with thick MSAF (40%) compared to moderate at 25% and thin meconium group at 13.6% (Table I & II).

DISCUSSION

When the duration of meconium staining was upto 1 hour even when foetal heart variation was present along with thin and moderate meconium staining, there was no perinatal mortality or morbidity. But with thick MSAF with foetal heart variation there was a definite increase in perinatal morbidity though mortality was nil.

When the duration of meconium staining ranged between 1-3 hours in thin and moderate MSAF with foetal heart rate variation, still the perinatal morbidity and mortality was nil. However with thick MSAF with foetal heart variation there was a marked rise in perinatal mortality 33.3% and morbidity 66.66%.

When the duration of MSAF was between 4-6 hours, even with thin meconium staining with foetal heart variation perinatal morbidity was there (14.3%). With moderate MSAF with foetal heart variation perinatal morbidity was 100%. With thick MSAF along with foetal heart variation perinatal mortality was 50% and morbidity was 50%.

Thus duration of meconium staining and thick MSAF are ominous features for interference especially so if accompanied by FH variations while if duration is upto 3 hours and meconium staining varies from thin to moderate with or without FH variation still the perinatal outcome was good although some caesarean sections had to be done in this group for bradycardia.

Miller et al (1975) have not found MSAF to herald a poor outcome unless other signs of foetal distress are present.

Post maturity rate was 14% in MSAF in this study which is comparable to that quoted by *Hellman et al (1958), Resnick (1955); Goud and Krishna (1989)* as 12.3%, 11.2% and 10.3% respectively. Associated risk factors were present in 24% cases which is a little lower than reported by *Nayak and Dalal (1991) (36.81%).*

Foetal heart rate variation rate of 21.7% in thin meconium staining 33.3% in moderate and 46.6% in thick is the same as reported by *Nayak and Dalal (1991)* 24.58% in thin and

46.7% in thick MSAF.

In thin and moderate MSAF there was no baby with low Apgar score at birth. While in thick MSAF 20% babies had low apgar score and there was 1 still birth, a finding comparable to that of *Goud and Krishna (1989)* who reported 17.6% rate of low apgar score in case of thick MSAF only.

Overall mortality in this study group was 6% and this related to only the thick MSAF group and the same was found by *Pendse (1983)* at 8% and *Goud and Krishna (1989)* at 7.26%.

Therefore it is inferred that meconium staining and foetal heart variation which are considered standard signs of foetal distress for interference need re-evaluation and are not a must for cutting short of the labour or doing a caesarean section. However such patients need strict and stringent supervision during labour for a good perinatal outcome. Of course additional investigative procedures in form of foetal scalp blood sampling and electronic monitoring if available are needed to evaluate the cases properly. But such procedures are not available to every Obstetrician even in the most prestigious institutions of the country, therefore the the stress on the clinical judgement.

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