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Original Research Article

Association of meconium stained amniotic fluid with Apgar score of neonate

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ABSTRACT

Background: The presence of meconium in amniotic fluid is indicated one of the foetal distress sign. The objective of the study was to see the association of meconium stained liquor and Apgar score of neonate.
Methods: Women admitted in labour room were classified as those with clear liquor or meconium stained. Labour was monitored and Apgar score of neonate was noted Data was analysed to see the association with Apgar score of neonate.
Results: Out of 250 women, 50 women had meconium stained liquor (MSL). MSL had significant association with poor Apgar score. There was no association between mode of delivery, interval between detection of meconium and delivery and the phase of labour in which it was detected with Apgar score.
Conclusions: Presence of meconium has effect on Apgar score. Close monitoring improves the neonatal outcome. Early identification and prompt management of women with meconium stained liquor will help to reduce the neonatal morbidity.

Keywords: Apgar score, Hospital stay, Meconium stained amniotic fluid

INTRODUCTION

Total 7-22% of term pregnancies are complicated by meconium stained amniotic fluid.[1,2] Presence of meconium in the amniotic fluid has long been considered as a sign of foetal distress due to hypoxia. It is a major cause of perinatal morbidity and mortality.[3]

Apgar score is the score given at the time of birth to assess condition of neonates. Apgar score is given at 1 minute, 5 minutes and 10 minutes and it's should be equal or more than 7 for indicating good condition of neonates. With meconium stained liquor, there are more chances of decreased Apgar score due to aspiration of meconium.

METHODS

This was an observational descriptive study conducted in Department of obstetrics and gynecology, SMS Medical College, Jaipur. It was conducted from October 2022 to September 2023. Institutional review board and ethics committee approval was taken prior to study.

Inclusion criteria

Women with single, cephalic, live pregnancy, more than 28 weeks in spontaneous labour, who were willing to participate and gave written informed consent were included.

Exclusion criteria

Those with congenital anomalies were excluded.

Written informed consent taken and all eligible women were monitored. When they passed meconium in amniotic fluid, they were selected as case and those who had a clear liquor were included in the control group. Complete history was taken, physical, systemic and per vaginal examination done. Labour was monitored closely. Obstetrics management done as per protocol.

Statistical analysis

Data was recorded and analysed. Statistical analysis was done by using Medcalc 16.4 version software. Continuous variables were expressed as mean and standard deviation and were compared by using unpaired T-test, one-way ANOVA test and Pearson correlation coefficient. Nominal and categorical variables expressed as percentages and were compared by using chi-square test and Fischer Exact test. P value <0.05 were taken as significant.

RESULTS

Total 250 women were included in the study and kept under observation during labour.50 women had meconium stained liquor (MSL) group and 200 women had clear liquor. Most women in both groups were between 21 to 25 years. Mean age was similar in both groups. The difference between incidence of MSL in various socioeconomic classes was statistically not significant (p>0.05). Of the 200 women with clear liquor, 48% were primigravida and in MSL group 66% cases were primigravida. There was statistically significant association between gravidity and MSL (p<0.05) (Table 1).

Table 1: Characteristics of study population.

		Clear liquor (n=200)	MSL (n=50)
Age (years)	Mean	25.63±4.37	25.40±3.89
Socio-economic status (%)	≤Lower middle class	81.5	78
Gravida (%)	Primigravida	48	66
Gestational age (%)	37-40 weeks	86	76

Of the 50 neonates with MSL, 74% had Apgar score ≥7, only 6% neonates had an Apgar ≤3. There were 8% e stillbirths. Among 200 neonates with clear liquor, 90.5% had ≥7 Apgar score, there were no stillbirths. The difference was statistically significant. Liquor had thick meconium (grade 3) of all those with still births and were referred cases (Table 2).

Table 2: Association of Apgar score with MSL.

Apgar score at birth	Clear liquor (n=200)		MSL (n=50)		Test of significance
	No.	%	No.	%	
0	-	-	4	8	X^2=29.5 Df=3 p<0.001
1-3	-	-	3	6	
4-6	19	9.5	6	12	
≥7	181	90.5	37	74	

Table 3: Relation of mode of delivery and Apgar score at birth.

Apgar score	Vaginal delivery (n=19)		Caesarean delivery (n=31)		Test of significance
	No.	%	No.	%	
<7 (n=13)	4	21.05	9	29.03	X^2=0.390 Df=1 p=0.532
≥7 (n=37)	15	78.95	22	70.97	

74% were delivered through caesarean delivery. There was no statistically significant difference in Apgar score between neonates delivered vaginally or by caesarean section (p>0.05). The decision to perform caesarean section was taken at the first sign of foetal distress, but if women had a good Bishop score indicating an early vaginal delivery, then vaginal delivery was performed (Table 3).

Association of Apgar score with phase of labour at which meconium was passed was analysed. Out of 26 women with meconium passed in latent phase of labour 76.92% had ≥7, 48% of women with meconium passed in active

stage, 70.83% had ≥7 Apgar score the association of phase of labour with Apgar score at birth was statistically not significant (p>0.05) (Table 4).

68% women delivered within one hour of detection of meconium, 67.65% of these had Apgar ≥7. 32% women delivered after one hour of detection of meconium, 87.5% had Apgar ≥7, however the difference was statistically not significant (p>0.05). The 2 who delivered after one hour and had poor score had stillbirth and hence were delivered vaginally.

There are various factors that have impact on perinatal outcome besides the time of detection of meconium, grade of meconium, bishop score at the time of detection of meconium, foetal heart rate and the decision of mode of delivery (Table 5).

Table 4: Association of Apgar score with phase of passage of meconium.

Apgar score	Latent phase of labour (n =26)		Active phase of labour (n=24)		Test of significance
	No.	%	No.	%	
0	2	7.69	2	8.33	X^2=1.42 Df=3 p>0.700
1-3	2	7.69	1	4.16	
4-6	2	7.69	4	16.66	
≥7	20	76.92	17	70.83	

Table 5: Association between interval between detection of meconium and delivery with Apgar score at birth.

Apgar score	Interval between detection of meconium and delivery				
	≤1 hour (n=34)		>1 hour (n=16)		Test of significance
	No.	%	No.	%	
≥7 (n=37)	23	67.65	14	87.5	X^2=2.229 Df=1 p=0.135
<7 (n=13)	11	32.35	2	12.5	

DISCUSSION

In the study, 20% women had meconium stained liquor (MSL). Difference between incidence of MSL across different age groups or in various socioeconomic classes was statistically not significant. In present study 66% MSAF cases were primigravida and was statistically significant.

The association of Apgar score with MSL was statistically significant (p<0.05).

In study done by Jain et al, it was found that new-born with meconium stained liquor had significantly reduced APGAR scores at 1 minute, 5 minutes and 10 minutes (p<0.05) when compared to clear liquor cases.[4]

In other studies, Mohan and Deepak et al, Naqvi et al, Wong et al also showed thick meconium stained amniotic fluid was associated with low Apgar score.[5-7]

There is vasospasm in umbilical cord due to hypoxia resulting in low Apgar score in MSL neonates.

Primigravida women were at a higher risk of having MSL. Similar results were also reported by other authors.[8-11] Primigravidae take longer time for cervical dilatation and descent of head. Cervical dystocia risk is also higher in primigravida as compared to multigravida, hence primigravida have higher risk of MSL.

There was no association between mode of delivery, interval between detection of meconium and delivery and the phase of labour in which it was detected with Apgar score. The decision of mode of delivery depended upon the bishop's score and aim was to deliver the foetus as soon as possible.

The study was performed in a single center which is a tertiary referral centre and hence not reflective of general population, as high number of referred cases in the hospital. Also, due to time limitations, perinatal outcome was followed only till neonates were discharged.

CONCLUSION

Presence of meconium has effect on Apgar score. Close monitoring improves the neonatal outcome. Early identification and prompt management of women with meconium stained liquor will help to reduce the neonatal morbidity.

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