

Original Research Article

Association of Bishop score with mode of delivery in women with meconium-stained amniotic fluid

Babita Panwar, Sindhu Sudha Gaur, Monika, Nupur Hooja*,
Shikha Sharma, Manisha Kumari

Department of Obstetrics and Gynecology, Sawai Man Singh Medical College, Jaipur, Rajasthan, India

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*Correspondence:

Dr. Nupur Hooja,

E-mail: nupurhooja@gmail.com

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ABSTRACT

Background: The presence of meconium in amniotic fluid is indicative of foetal distress. Bishop score helps guide the mode of delivery. However, in presence of meconium-stained liquor, the decision may be based on severity of foetal distress. The objective of the study was to see the association of Bishop score with mode of delivery in women with meconium-stained amniotic fluid.

Methods: Women admitted in labour room were classified as those with clear liquor or meconium stained. Bishop score was noted of all. Labour was monitored and decision of mode of delivery was made as per protocol. Data was analysed.

Results: 50 women, out of the 250 monitored had meconium-stained liquor (MSL). MSL had significant association with mode of delivery. There was association between bishop score and mode of delivery. There was a higher caesarean delivery rate with MSL. A <7 score had greater risk of cesarean delivery. Primigravida had poorer Bishop score and hence had a higher cesarean section rate.

Conclusions: Presence of meconium and bishop score effect mode of delivery. Close monitoring improves the neonatal outcome. Counselling regarding mode of delivery after estimating the Bishop score can be done.

Keywords: Bishop score, Meconium-stained amniotic fluid, Mode of delivery

INTRODUCTION

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

Foetal risk factors like nuchal cord, knots in the cord, cord prolapse, Intrauterine growth restrictions, fetoplacental insufficiency may cause meconium-stained liquor.⁴ When oxygen saturation drops, it causes gasping of foetus, leading to aspirations of meconium-stained amniotic fluid. This has long and short term foetal adverse outcomes that may lead to low APGAR score, increase neonatal resuscitation care, neonatal nursery

admission, meconium aspiration syndrome, acute respiratory distress, chemical pneumonitis, tension pneumothorax, pulmonary diseases, neonatal sepsis.⁵

So, for avoiding these perinatal outcomes, we go for Bishop score evaluation to decide mode of delivery as early as possible. Bishop score involves cervical dilatation, cervical length, cervical consistency, cervical position and head station.⁶ If score >7 then vaginal delivery possible as early as possible and we can avoid complicating perinatal outcome. Remodelling of cervix begins before the onset of labour.⁷

METHODS

The study was an observational prospective study, performed in Zenana Hospital, Jaipur, from October 2022

to September 2023. Institutional review board and ethical committee clearance was taken before proceeding with the study. Women with more than 28 weeks in spontaneous labour in cephalic presentation with normal foetal heart rate were included. Those with congenital anomalies were excluded.

Informed written consent was taken. Labour was monitored. If meconium was passed, they were grouped as case and those with clear liquor were in the control group. Complete history and examination done. Per vaginal examination was done and Bishop score was evaluated. Obstetrics management done as per protocol. Data was recorded and analysed. Statistical analysis was done by using Medcalc 16.4 version software. P value <0.05 were taken as significant.

RESULTS

There were 250 women included in the study. These women were kept under close monitoring in labour. There were 50 women with meconium stained liquor (MSL) A group and 200 women with clear liquor B group. Women

in both groups were between 21 to 25 years. Mean age was 25.63 ± 4.37 years gr A and 25.40 ± 3.89 years gr B which was similar in both groups. The difference between incidence of MSL in various socioeconomic classes was statistically not significant [81.5% (group A) and 78% (group B) belonged to lower middle socio-economic status or less than that]. All women had gestational age more than 37 weeks (mean being 38.2 weeks in group A and 38.4 weeks in group B). Most women in both groups were from urban area, as hospital is located in an urban area. 48% were primigravida in clear liquor group and 66% were primigravida in MSL group.

Out of the 200 women with clear liquor, 91.5% had vaginal delivery and only 8.5% had cesarean whereas in MSL group 62% had cesarean.

There was a statistically significant association between MSL and mode of delivery ($p < 0.05$).

The odds of having cesarean section in MSL group was 17.563 (Table 1).

Table 1: Association between mode of delivery and clear liquor or MSL.

Mode of delivery	Clear liquor (n=200)		MSL (n=50)		Odd's ratio	Test of significance
	No.	%	No.	%		
Vaginal delivery	183	91.5	19	38	1	$\chi^2=73.800$ Df=1
Cesarean delivery	17	8.5	31	62	17.563 (8.238-37.443)	$p < 0.001$

Table 2: Association of Bishop score and mode of delivery in neonates with MSL.

Mode of delivery	Bishop score <7 (n=21)		Bishop score ≥ 7 (n=29)		Test of significance
	No.	%	No.	%	
Vaginal delivery	1	4.8	18	62.1	$\chi^2=16.978$ Df=1
Cesarean delivery	20	95.2	11	37.9	$p < 0.001$

Table 3: Association of mode of delivery with bishop score and gravidity in women with MSL.

Gravida	Mode of delivery	BISHOP score <7 (n=21)		BISHOP score ≥ 7 (n=29)		Test of significance
		No.	%	No.	%	
Primi n=33	Vaginal 12	0	0	12	63.2	$\chi^2=13.895$ Df=1
	Cesarean 21	14	100	7	36.8	$p < 0.001$
>2 n=17	Vaginal 7	1	14.3	6	60.0	$\chi^2=3.53$ Df=1
	Cesarean 10	6	85.7	4	40.0	$p = 0.059$

In women with MSL having Bishop score <7, 95% had cesarean section delivery, and with Bishop score >7, 37.9% had cesarean section delivery. This difference in mode of delivery with Bishop score was statistically significant ($p < 0.05$).

The Bishop score is a prelabour scoring system that helps to predict the likelihood of a successful vaginal delivery. It takes into account cervical dilatation, length of cervix, consistency, position and station of foetal head. A lower

Bishop score typically indicates that the cervix is not yet ready for labour, making cesarean section more likely in women with MSL. Conversely, a higher bishop score suggests a more favourable cervix for spontaneous vaginal delivery under close foetal heart rate monitoring (Table 2).

Among primigravida women with MSL having bishop score <7, all cases underwent cesarean section and women with Bishop score >7, 63.2% cases had vaginal delivery, and 36.8% had cesarean delivery.

The association of Bishop score with mode of delivery among primigravida women with MSL was statistically significant ($p < 0.05$).

With close monitoring of foetal heart rate and favourable Bishop score, women can have a vaginal delivery. Primigravida takes longer time for progression of labour with poor Bishop score so decision for cesarean section is taken for better perinatal outcome (Table 3).

Among multigravida women with MSL, all except one who underwent vaginal delivery had Bishop score > 7 . Whereas with Bishop score < 7 , 85.7% cases underwent cesarean section. Only 40% had BISHOP score > 7 , when they had cesarean delivery.

The association of Bishop score with mode of delivery among multigravida women with MSL was statistically not significant ($p > 0.05$).

Multigravida women who underwent cesarean delivery had only 0.111 times odds of having BISHOP score ≥ 7 compared to women who underwent vaginal delivery ($p > 0.05$).

In multigravida women there was moderate association present between mode of delivery and Bishop score this may be due to multigravida women progress rapidly in labour as compared to primigravida. The moderate risk of cesarean section over vaginal delivery with good Bishop score may be to prevent poor perinatal outcomes

DISCUSSION

There was significant association between MSL and mode of delivery. There was a higher caesarean delivery rate with MSL. The difference in mode of delivery with Bishop score was also statistically significant, a < 7 score had greater risk of cesarean delivery. Primigravida take longer time for progression of labour with poor Bishop score and hence had a higher cesarean section rate.

In a study done by Bhinder et al, 62% neonates with MSL were delivered by cesarean section.⁸ In a similar study, Saunders et al reported that cesarean section was twice as frequently with meconium-stained amniotic fluid.⁹ In another similar study done by Shaikh et al, the cesarean section rate was 82% and in Chand et al 48% were by LSCS and 52% were vaginal delivery.^{5,10}

In another study by Chhetri et al, cesarean section was done in 40% cases.¹¹

Increased incidence of LSCS in the study was seen which may be due to close foetal monitoring during labour and resorting to LSCS at the earliest sign of foetal distress.

Bhasin et al concluded that meconium-stained amniotic fluid was associated with increased incidence of cesarean section, and suggested that obstetrician should be more

vigilant while dealing with cases of thick type of MSAF, specially in primigravida and high-risk pregnancies. A timely caesarean section improves the neonatal outcome.¹²

The Bishop score continues to be a widely used and trusted tool in obstetrics to determine cervical favourability and guide labour induction strategies.¹³

It takes into account cervical dilatation, length of cervix, consistency, position and station of foetal head. A lower Bishop score typically indicates that the cervix is not yet ready for labour, making cesarean section more likely in women with MSL. Conversely, a higher bishop score suggests a more favourable cervix for spontaneous vaginal delivery under close foetal heart rate monitoring.

In their study, Bahadori et al observed that Bishop score alone was not a good predictor for spontaneous vaginal delivery outcome as at early term Bishop score were different from late term.¹⁴

The study was performed in a single center which is a tertiary referral center, where monitoring was done by trained doctors and hence may not be representative of entire population. Also, due to limitation of time, the perinatal outcome was followed only till neonates were discharged.

CONCLUSION

Presence of meconium and Bishop score affect mode of delivery. Close monitoring improves the neonatal outcome. Counselling regarding mode of delivery after estimating the Bishop score can be done.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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