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Echogenic liquor at term pregnancy on ultrasonography is not always meconium

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ABSTRACT

Introductions: The presence of echogenic amniotic fluid at term pregnancy on sonography is uncommon. Finding of meconium in the amniotic fluid by ultrasound is used to predict mode of delivery of fetus, fetal wellbeing and risk of intrauterine fetal demise. We aim to observe the clinical significance of echogenic liquor at term pregnancy.

Methods: This was a retrospective study of 102 cases of echogenic liquor at gestation age between 36 and 41 weeks (term pregnancy) during five years 2010 to 2015A.D. Amniotic fluid index (AFI) was calculated. Fluid was observed for presence of vernix caseosa or meconium stain during spontaneous and artificial rupture of membrane. The APGAR score of baby was taken twice at 5 and 10 minutes.

Results: Among the 102 patients with echogenic amniotic fluid at term, 83 (81.4%) were vernix and 19 (18.6%) had meconium stain. Low APGAR scores were found in 5 (0.9%) and normal score in 97 (95.1%) indicating good fetal outcome. Among these cases, 89 (87.3%) had normal AFI and 13 (12.7%) had decreased liquor.

Conclusions: There were no association between echogenic liquor and meconium stain, AFI or APGAR score of the baby in term pregnancy.

Keywords: AFI, echogenic liquor, fetal outcome, prenatal ultrasound, term pregnancy, vernix or meconium.

INTRODUCTIONS

The presence of echogenic amniotic fluid at term pregnancy on ultrasonography (USG) is uncommon.¹ The clinical significance of echogenic amniotic fluid and fetal outcome remains undetermined. It is of great concern to find the meconium in the amniotic fluid during USG and predict further management for fetal wellbeing, mode of delivery and risk of intrauterine fetal demise. Presence of meconium in amniotic fluid is associated with an increased risk of fetal asphyxia. Early literatures have reported that identification of meconium is possible if liquor appear echogenic in USG but recent studies report vernix rather than meconium.² This study aim to differentiate meconium from vernix by ultrasound in echogenic liquor.

METHODS

This was a cross sectional study of USG findings of echogenic liquor at term pregnancy (gestation age between 36 and 41 weeks) during five years from 2010 to 2015 A.D. Echogenic liquor is considered if echogenicity is almost equal to placenta and clear contrast between umbilical cord and liquor were included.

Medison, Sonosite and Aloka ultrasound machines were used to calculate the amniotic fluid index (AFI) in radiology department of Patan Hospital. The AFI was divided into normal and decreased. All patients delivered within 24 to 48 hours of USG scan. The appearance of liquor was visually assessed during spontaneous or artificial rupture of membrane for vernix caseosa or meconium stain based on consistency and changes of color. Then APGAR score of baby was taken twice, at 5 and 10 minutes.

Data entry and analysis was done using SPSS software. Univariate and Multi-variate logistic regression analyses were carried out using the outcome of echogenic fluid analysis as

dependent variable (vernix caseosa = 0, meconium stain = 1). The characteristics of study participants and her child was taken as independent variables. A p-value less than 5% (<0.05) was taken as statistically significant.

RESULTS

In five years, total of 22,179 USG were performed for liquor examinations. Among them, 102 had echogenic liquor, 19 (18.62%) were positive for meconium and rest had vernix caseosa. Echogenic liquor appear 7 out of 10 pregnancies of ≥ 36 weeks compared to 3 out of 10 for pregnancies of < 36 weeks. Low birth weight and low APGAR score were less than 5%. (Table 1).

Women's age and mode of delivery were associated with the presence of meconium stain in the echogenic fluid as seen in bivariate logistic regression analyses, (Table 2). Specifically, chance of having meconium stain in the echogenic fluid was 3.39 times higher for women of more than 25 years of age than less than 25 years. Similarly, women undergoing LSCS were 3.40 times more likely to have meconium stain in the echogenic fluid than women delivering through Spontaneous vaginal delivery.

DISCUSSIONS

We found more vernix than meconium in our study. Out of 102 echogenic liquor 83 (81.37%) were vernix and only 19 (18.63%) were meconium. Benacerraf et al stated that the ultrasound diagnosis of meconium stained amniotic fluid could be made if amniotic fluid appear diffuse echogenic pattern throughout the amniotic cavity and clear contrast between the amniotic fluid and umbilical vessels². In another study of case reported with similar findings identified vernix rather than meconium although prenatally they were mistakenly diagnosed as meconium³. Recently cases reports of echogenic amniotic fluid on

prenatal USG were also found to be vernix during artificial and spontaneous rupture of membrane at delivery¹ like our study. The study in 1976 noted that on USG vernix appeared after 36 weeks causing cloudy appearance of amniotic fluid⁴ similar to our findings.

A prospective study compared 20 fetuses and found no association of echogenic amniotic fluid with meconium.⁵ Another retrospective study reports that out of 19 cases only one (5%) was meconium stain, and 18 (95%) were vernix.⁶ They concluded that the ultrasound was not reliable indicator of meconium or blood and therefore should not typically alter

antenatal management. We had similar findings.

The study done in twin pregnancy with echogenic amniotic fluid revealed clear fluid in 32%, vernix caseosa in 63% and meconium in 5%. In co-twins with anechoic amniotic fluid revealed clear fluid in 47%, vernix caseosa 32% and meconium in 21% and concluded that echogenic amniotic fluid is not predictive of prenatal ultrasonography.⁷

Mungen et al.⁸ studied 950 singleton pregnancies at more than 37 weeks of gestation and echogenic amniotic fluid was found in 7% where as in our study the incidence of echogenic amniotic fluid was only

Table 1. Characteristics of the study participants with echogenic liquor and outcome of the delivery

Characteristics	N	%
Liquor		
Vernix caseosa	83	81.37
Meconium stain	19	18.62
Amniotic Fluid Index (AFI)		
Normal	89	87.25
Decreased	13	12.75
Age (completed year)¹		
<= 25	56	54.90
> 25	46	45.10
Gender of child		
Female	31	30.39
Male	71	69.61
Parity		
Primi	61	59.80
Multi	41	40.20
Pregnancy duration		
<= 36 weeks	29	28.43
> 36 weeks	73	71.57
Mode of delivery		
SVD	45	44.12
LSCS	57	55.88
Birth weight		
Low	3	2.94
Normal	99	97.06
APGAR score		
Low	5	4.90
Normal	97	95.10

Note: Age was divided into two equal parts using median as cut-off, SVD=Standard Vaginal Delivery, LSCS = Caesarean Section, APGAR = Appearance, Pulse, Grimace, Activity, Respiration

Table 2. Logistic regressions showing association between echogenic liquor, characteristics of study participants and outcome of child

Characteristics	Bivariate Model			Multivariate Model		
	OR	95% CI of OR	p-value	AOR	95% CI of OR	p-value
Age (years)						
> 25	3.39	1.24-9.24	0.017	4.78	1.44-15.83	0.010
<=25			Reference category			
Gender of child						
Male	0.92	0.33-2.54	0.870	1.21	0.38-3.84	0.744
Female			Reference category			
Parity						
Multi	0.63	0.23-1.72	0.368	0.47	0.15-1.46	0.188
Primi			Reference category			
Pregnancy duration						
> 36 weeks	1.46	0.48-4.40	0.505	1.25	0.36-4.30	0.726
<= 36 weeks			Reference category			
AFI						
Decreased	1.75	0.48-6.35	0.505	2.32	0.50-10.72	0.282
Normal			Reference category			
Mode of delivery						
LSCS	3.40	1.14-10.10	0.028	2.55	0.80-8.14	0.115
SVD			Reference category			
Birth weight						
Normal	NA	NA	0.999	NA	NA	0.999
Low			Reference category			
APGAR Scores						
Low	0.905	0.096-8.53	0.930	1.56	0.13-10.13	0.729
Normal			Reference category			

Note: OR = Unadjusted Odds Ratio, AOR = Adjusted Odds Ratio, CI = Confidence Interval, NA = Not applicable, AFI=amniotic fluid index

0.7%. They concluded that since sonographically echogenic amniotic fluid at term gestation was not associated with any adverse pregnancy outcome, such a finding should not alter routine antenatal management like our study. In our study, also there is no statically significant for adverse pregnancy outcome regarding meconium stain, AFI, fetal weight and APGAR for echogenic liquor. However, we found that the higher age of women and mode of delivery as significant predictor of meconium stain in bivariate analysis but women's age was the only independently associated variable with meconium stain.

The limitation of our study could be three different ultrasound machines and different operators, and less number of cases with

echogenic liquor. Single machine and operator could decrease the bias.

CONCLUSIONS

Our findings re-affirm that echogenic amniotic fluid on ultrasound is vernix in majority of cases rather than meconium in term pregnancy and do not need active management of pregnancy.

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