

The Relation of Intrapartum Amniotic Fluid Index to Perinatal Outcomes

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ABSTRACT

Objective: The objective of this cross-sectional study is to evaluate the relation of intrapartum Amniotic Fluid Index to adverse perinatal outcomes.

Methods: The study included 120 patients with singleton pregnancy at term presented with early labour pain in Sir Salimullah Medical College Mitford Hospital, Dhaka from February 2014 to July 2014. Informed consent was taken from each patient. Data was collected by using a standard set of questionnaire to analyze the patient profile and management pattern of patients.

Results: In this study, more common age group was 15-19 years (46.7%) and most of them were house wives (95%) & came from below average income group (58.3%). Three fourth (75%) of the patients underwent caesarian section who had AFI <5cm, where as 60.0% needed LSCS who had AFI 5-7 cm & 22.6 % had AFI >7 cm. Meconium stained liquor was found 56.3% of patients who had AFI <5 cm, 25.0% had 5-7 cm AFI & 14.3% had >7cm AFI. 1st min Apgar score <7 was more (84.6%) in babies of the patients with AFI <5cm & 65.0% mothers having 5-7 cm AFI, 23.8% mothers having >7cm AFI. At 5th min Apgar score <7 in 23.0% babies whose mothers had an AFI <5cm, 15.0% babies of mothers having AFI 5-7cm & 2.4% babies of mothers having AFI >7cm. More babies born to

mothers having AFI <5 cm were found to be asphyxiated both at 1st min & 5th min Apgar score.

Conclusions: The current study was done to find out the relation of intrapartum Amniotic Fluid Index to perinatal morbidity and mortality. Fetal complications such as meconium aspiration, birth asphyxia, admission to neonatal ICU, neonatal death & still born were more common in oligohydramnios. Less intrapartum AFI is related with adverse delivery & perinatal outcomes.

Keywords: Amniotic Fluid Index, Perinatal Outcomes.

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INTRODUCTION

Amniotic Fluid (AF) is the protective clear fluid that surrounds the fetus during pregnancy. Amniotic fluid has a number of important functions like development of musculoskeletal system by permitting fetal movements, growth and development of gastrointestinal tract (GIT) by swallowing amniotic fluid and it provides essential nutrients to fetus.¹ It also protects fetus from trauma, maintains body temperature and has bacteriostatic properties. It also assists in pulmonary development. Amniotic Fluid Volume (AFV) rises to a plateau between 22-39 weeks of gestation reaching upto 700-850 ml, which corresponds to an Amniotic Fluid Index (AFI) of 14-15 cm. Evaluation of AF by palpation is deceptive, whereas its assessment on ultrasonography (USG) is more reliable.² During the last 30 years, a wide range of tests have been introduced to determine fetal

well-being including AFI. It is calculated as the sum of the deepest vertical dimension of AF pocket in each quadrant of uterus. Oligohydramnios is defined as an AFI < 5 cm. In 1990, Moore and Cayle defined oligohydramnios as an AFI below the 5th centile for the gestational age.³ Oligohydramnios associated with Intra Uterine Growth Restriction (IUGR) is secondary to increased resistance of flow through renal artery due to hypoxemia. Nonsteroidal anti-inflammatory drugs inhibit renal vascular flow and thereby reduce AFV. Sequelae of chronic oligohydramnios can be fetal demise, pulmonary hypoplasia, facial and skeletal deformities.

Reduced liquor volume in labour may reduce the volume of intervillous space, which may predispose to umbilical cord occlusion, both of which increase the risk of fetal hypoxemia and

will affect the Apgar score of baby at birth. APGAR is a quick test performed on a baby at 1 and 5 minutes after birth.⁴ It describes cardiorespiratory or neurological depression of the newborn. Low Apgar score signifies a problem that needs attention and management. In patients with AFI < 5 cm, determination of optimal time of delivery is necessary and labour should not be prolonged. It has been observed that intrapartum AFI < 5 cm is associated with significant increase rate of Lower Segment Caesarean Section (LSCS) for fetal distress and low Apgar score at 5 minutes (Apgar score <7)⁴. The current local practices relies heavily on AFI estimation. The aim of this study is to relate the intrapartum AFI to perinatal outcomes.

MATERIALS AND METHODS

The study included 120 patients with singleton pregnancy at term presented with early labour pain in Sir Salimullah Medical College Mitford Hospital from February 2014 to July 2014. Informed consent was taken from each patient.

Data was collected by using a standard set of questionnaire to analyze the patient profile and management pattern of patients. Sample size was 120.

After collection of information, data was checked, verified for consistency and was entered for finalized result. After editing & coding, the coded data was directly entered into the computer by using the SPSS/PC software.

Table 1: Socio-demographic characteristics of the study subjects (n=120)

Age in years	Frequency	Percentage
15-19	56	46.7
20-24	37	30.8
25-29	18	15.0
30-34	9	7.5
Occupation		
House Wife	114	95.0
Service	05	4.2
Others	01	0.8
Socioeconomic status		
Below average income group	70	58.3
Average income group	40	33.3
Above average income group	10	8.3

Table 2: Distribution of the patients according to their Amniotic Fluid Index (n=120)

AFI(cm)	No. of patients	Percentage
<5cm	16	13.3
5-7	20	16.7
>7	84	70.0

Table 3: Distribution of study patients according to mode of delivery (n=120)

Mode of delivery	AFI <5cm (n=16)		AFI 5-7 (n=20)		AFI >7 (n=84)	
	n	%	n	%	n	%
Vaginal delivery	4	25.0	8	40.0	65	77.4
LSCS	12	75.0	12	60.0	19	22.6

Table 4: Distribution of the study patients according to meconium liquor (n=120)

Meconium liquor	AFI <5cm (n=16)		AFI 5-7 (n=20)		AFI >7 (n=84)	
	N	%	n	%	n	%
Presence	9	56.3	5	25.0	12	14.3
Absence	7	43.7	15	75.0	72	85.7

Table 5: Distribution of the study patients according to fetal outcome (n=120)

Fetal outcome	AFI <5cm (n=16)		AFI 5-7 (n=20)		AFI >7 (n=84)	
	N	%	N	%	n	%
Healthy baby	3	18.7	10	50.0	68	80.9
Meconium aspiration	5	31.3	5	25.0	10	11.9
Birth asphyxia	2	12.5	2	10.0	4	4.8
Admission to NICU	3	18.7	3	15.0	2	2.4
Neonatal death	2	12.5	0	00	0	00
Still born	1	6.3	0	00	0	00

Table 6: Distribution of the study patients according to APGAR score (n=120)

Apgar score	AFI <5cm (n=13)		AFI 5-7 (n=20)		AFI>7 (n=84)	
	N	%	N	%	n	%
1 min						
<7	11	84.6	13	65.0	20	23.8
>7	2	15.4	7	35.0	64	76.2
5 min						
<7	3	23.0	3	15.0	2	2.4
>7	10	77.0	17	85.0	82	97.6

Table 7: Distribution of the study patients according to birth weight (n=120)

Birth weight	AFI <5cm (n=16)		AFI 5-7 (n=20)		AFI>7 (n=84)	
	N	%	N	%	n	%
<2.5 kg	2	12.5	1	5.0	5	5.9
2.5-3.9 kg	13	81.3	17	85.0	75	89.3
>4 kg	1	6.2	2	10.0	4	4.8

RESULTS AND DISCUSSION

This cross sectional study was carried out with an objective to determine the impact of amniotic fluid index on perinatal outcome in term pregnancy. A total 120 women with early onset labour pain were included in the study from February 2014 to July 2014. The present study findings discussed and compared with previously published relevant studies.

In the present study majority of the patients (46.7%) was 15-19 years age group. This may be due to the early marriage and pregnancy scenario of our country. Most of the patients (95%) were housewives and mostly belong to below average income group (58.3%).

Amniotic fluid index was <5 cm in 13.3% cases, 5-7 cm in 16.7% cases and >7 cm in 70% cases. Dasari et al ⁶ have made almost identical observation in their study.

Regarding the mode of delivery it was observed that three fourth (75%) of the patients underwent LSCS who had AFI <5 cm, where as 60% needed LSCS having AFI 5 to 7 cm and in 22.6% cases who had >7 cm AFI. On the other hand only 25% patients had vaginal delivery with AFI <5cm.

In the current study it was observed that, the meconium stained liquor was found in 56.3% of patients who had AFI <5 cm, 25% of those who had AFI 5 to 7 cm. On the other hand only 14.3% had meconium stained liquor having AFI >7 cm.

In this study, it was found that most (81.3%) of fetal complications were found in patients having AFI <5 cm, 50% in those who had AFI 5 to 7 cm and 19.1% had >7 cm AFI. Meconium aspiration, birth asphyxia and admission to neonatal ICU were more common in patients with AFI <5 cm which was 31.1%, 12.5% and 18.7% respectively. Two neonatal deaths & one still born were observed only with patients having AFI <5 cm. Almost similar observations were found in other studies by Akhter et al. Al-Bayatti and Bangal et al.⁷⁻¹⁰ All investigators have observed significant fetal complications in patients with oligohydramnios.

In the present study it was observed that APGAR Score at 1st minute of birth <7 ,in maximum babies(84.6%) of patients who had AFI <5 cm, 65% of patients with AFI 5 to 7 cm and 23.8% patients with AFI >7 cm . At 5th minute of birth, APGAR score <7, in 23% babies whose mothers had an AFI <5 cm , 15% babies of mothers having AFI 5 to 7 cm and 2.4 % babies of mothers

having AFI >7 cm. Babies of mothers having AFI <5cm were found more asphyxiated both at 1st and 5th min APGAR score. Therefore the findings of the study are in well agreement with the findings of the other research works.¹¹⁻¹⁴

In this study low birth weight babies were born in 12.5% patients with AFI <5 cm, though most of the babies had normal birth weight of 2.5-4 kg. Abotalib et al.⁵ found the mean birth weight was 3.3±0.44 kg, which indicates that most of the babies were normal birth weight, which is similar with the present study.

CONCLUSION

The study shows an AFI< 5cm detected during early intrapartum period in patients of term pregnancy is an indicator of poor perinatal outcome. In presence of decreased amniotic fluid index (AFI), the occurrence of meconium stained liquor, fetal distress, rate of LSCS, low Apgar score, and admission in neonatal unit, still birth and neonatal death are high.

Determination of AFI can be used as an adjunct to other fetal surveillance methods. It is a valuable screening test for predicting fetal distress in labour. It helps to detect those infants at risk of poor perinatal outcome. AFI measurement in antepartum or intrapartum period can help to identify women who need increased surveillance for pregnancy complications and such women should be managed in a special unit to combat the complications effectively. Though more randomized controlled trials are necessary to assess the clinical effectiveness of delivery based on ultrasound assessment of AFI.

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