



Research Article

COMPARATIVE STUDY OF NORMAL AMNIOTIC FLUID INDEX VERSUS DECREASED AMNIOTIC FLUID INDEX MEASUREMENT IN PREDICTING PERINATAL OUTCOME AT OR BEYOND 40 WEEKS OF GESTATION

Nasreen Noor*, Seema Amjad Raza, Shazia Parveen, Mohd Khalid and Syed Manazir Ali

Department of Obstetrics and Gynaecology, Radiodiagnosis and Paediatrics J.N.M.C.H., A.M.U., Aligarh

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ABSTRACT

Objectives: To compare normal amniotic fluid index versus decreased amniotic fluid index measurement for predicting perinatal outcomes at or beyond 40 weeks of gestation.

Material and Methods: The present study was a prospective observational study and includes 120 normal antenatal women at gestational age 40 weeks or beyond (By Last Menstrual Period/1st Trimester Scan). After Institutional Ethics Committee approval all recruited women were assessed at the 3rd trimester visit for baseline demographic and obstetric data. After taking a detailed history and examination women were subjected to ultrasonography for amniotic fluid index (AFI). Based on ultrasonography measurement of AFI women were divided into 2 groups. The correlation of normal amniotic fluid index versus decreased amniotic fluid index measurement with perinatal outcome were computed for the two groups.

Group I - Women having Normal AFI

Group II - Women having Decreased AFI

Results: In Group I 31(34.44%) women were induced and in Group II 30 (100%) were induced for oligohydramnios. 65 women (72.22%) Vs 10 women (33.33%) had normal vaginal delivery and 25 women (27.28%) Vs 20 women (66.67%) had undergone LSCS in Group I and Group II respectively. Higher rate of LSCS was observed in Group II and the results were significant ($p < 0.05$). Significant difference between the rate of LSCS for fetal distress was observed between Group II. There was a significant difference for presence of meconium (33.33%) in Group II compared to Group I. The Mean \pm SD of Apgar score at 5 minute was 8.15 ± 0.36 Vs 8.13 ± 0.34 in the two groups, respectively ($p > 0.944$).

Conclusion: Decreased Amniotic fluid index (AFI) excessively characterizes patients as having oligohydramnios, leading to an increase in mortality.

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INTRODUCTION

Amniotic fluid assessment by ultrasound is one of the important tools in assessing the fetal health in all risk categories especially beyond the period of viability by P.Nash^[1]. Delivery beyond 42 weeks is associated with a fourfold increase in death in utero, as well as a threefold increase in neonatal death compared with delivery at term by Crowley P^[2]. In addition to mortality, there is an increased risk of meconium aspiration syndrome, neonatal seizures and long term handicap by Minchom P^[3]. Assessment of amniotic fluid volume (AFV) is an integral part of antenatal ultrasound evaluation during screening exams, targeted anatomy examinations, and in tests assessing fetal well-being. Abnormal AFV has been associated with an increased risk of perinatal mortality and several adverse perinatal outcomes, including premature rupture of membranes (PROM),

fetal abnormalities, abnormal birth weight, and increased risk of obstetric interventions by Harman CR^[4]. The ultimate goal of antepartum surveillance program is to improve perinatal outcome and to decrease intrauterine fetal demise besides prevention of maternal morbidity and mortality by Yeo et al.^[5], R.Liston et al^[6]. A fetus in distress should be identified at the earliest so that timely delivery will not only salvage the fetus but also prevent long term neurological impairments such as injury to fetal central nervous system by A. A. Baschat et al.^[7]. These risk increases from the expected date of confinement (40 weeks of gestation) as placental insufficiency and postmaturity (greater than 42 weeks of gestation) are associated with an exponential increase in the risk of perinatal death by Bergjsø^[8]. Though there are several ways by E. A. Dubil^[9] to assess quantity of amniotic fluid ranging from clinical palpation to measurement of single deepest vertical pocket A.F.Nabhan et al.^[10], amniotic fluid index (AFI) by four-quadrant technique as described by Phelan et al.^[11]. At term, oligohydramnios increases the risk of labor induction,

*Corresponding author: Nasreen Noor

Department of Obstetrics and Gynaecology J.N.M.C.H., A.M.U., Aligarh

the deceleration in fetal heart rate (FHR) tracings during labour, and recourse to cesarean delivery. Its effect on adverse neonatal outcome is less clearly documented by Locatelli *et al.* [12]. Thus, the present study was carried out in an effort to compare normal Amniotic Fluid Index with decrease amniotic fluid index with perinatal outcome.

MATERIAL AND METHODS

The present study was a prospective observational study and includes 120 pregnant women with known last menstrual period, history of regular menstruation, singleton pregnancy, gestational age from 40wks or beyond. The exclusion criteria were history of gestational hypertension, diabetes mellitus, intrauterine growth restriction, hydrops fetalis, congenital malformations, twins, polyhydramnios and premature rupture of membranes. After approval by Institutional Ethics Committee all recruited women were observed for baseline demographic and obstetric data including age, parity and past medical events at first antenatal visit. After taking a detailed history and examination all women provided an informed written consent and underwent ultra sound evaluation for Amniotic Fluid index (AFI). The women were divided into 2 Groups based on measurement of AFI ultrasonologically

- Group I-** Women having Normal AFI
- Group II-** Women having Decreased AFI

The Primary outcome measures were presence of meconium, rate of diagnosis of oligohydramnios, Apgar score at 1 and 5 minutes, birth weight, admission to NICU, neonatal morbidity and mortality and number of perinatal death while secondary outcome were induction of labor, mode of delivery and rate of caesarean section for fetal distress. The correlation of Amniotic fluid index with perinatal outcome were computed for the two groups. 'P' values of less than 0.05 were considered statistically significant

RESULTS

In the present study, 120 antenatal women were included after fulfilling the inclusion and exclusion criteria. The women were divided into two Groups based on measurement of AFI ultrasonologically. Maternal baseline characteristics were similar between the two groups in terms of age, parity and gestational age (Table 1). In Group I, out of 90 women about 31(34.44%) were induced and 59(65.56%) women spontaneously progressed into labor. In Group II, 30(100%) women were induced for oligohydramnios diagnosed on the basis of decreased AFI (<5cm). Hence AFI increases the rate of diagnosis of oligohydramnios and labor induction (Table 2). Our study shows that in Group I 72.22% (65women) had normal vaginal delivery and 27.28%(25women)undergone LSCS, while in Group II 33.33% (10 women) had vaginal delivery and 66.67% (20 women) had undergone LSCS. There is a significant difference in mode of delivery between the two groups, i.e. more women undergone LSCS in Group II (decreased AFI) in comparison to Group I (normal AFI) (Table 3).As shown in (Table 4) there was a significant difference in the rate of LSCS between the two groups i.e. a higher rate of LSCS for fetal distress is observed in Group II.

The mean birth weight in our study was 2.96±0.36 and there was no significant difference between the birth weights of the two groups. There is a significant difference between the

groups with about 33.33% presence of meconium in Group II i.e. patients having decreased AFI. The Mean±SD of Apgar Score at 1 minute was 7.10±0.30 and at 5 minutes was 8.14±0.355. There was no significant difference between the groups for Apgar Score (p=0.9). In our study, 2 neonates were admitted in NICU and died later due to valvular heart disease. However there was no statistical difference between the groups (p=0.7) (Table 5)

Table 1 Demographic profile of the study subjects

Parameters	Group I (n= 90)	Group II (n=30)	'p' value
Age (years)	24.63±4.13	24.00±3.09	0.57
(Mean ±SD)			
Gravidity	39 (43.3%)	12 (40%)	0.9
Primi	51 (56.7%)	18(60 %)	
Multi			
Gestational age (weeks)	66 (73.3)	27(90)	
≥40wks			
≥41wks	14(15.6)	019(3.3)	
≥42wks	10(11.1)	02(6.7)	

Table 2 Rate of diagnosis of Oligohydramnios and Induction of Labour

Induction of Labour	Group I (n= 90)		Group II (n=30)		'p' value
	No.	%	No.	%	
Yes	31	34.44	30	100	0.0001
No	59	65.56	00	000	0.0001
Total	90	100	30	100	

Table 3 Mode of Delivery

Mode of Delivery	Group (n= 90)		Group II (n=30)	
	No.	%	No.	%
VD	65	72.22	10	33.33
LSCS	25	27.78	20	66.67
Total	90	100	30	100

Table 4 Indications for LSCS

Indication for LSCS	Group I		Group II	
	No.	(%)	No.	(%)
Fetal Distress with MSAF	8	32	10	50
Fetal Distress with non reassuring CTG	8	32	06	30
NPOL	5	20	02	10
Failed Induction	4	16	02	10
Total	25	100	20	100

Table 5 Neonatal Outcome

Neonatal Outcome	Group Ia	Group Ib	Pvalue
Birthweight	2.96	2.99	0.6
Meconium	8	9	0.1
Apgar Score <7at 5mins	0	0	0.9
NICU Admission	1	1	0.7
MAS	0	0	00
Neonatal Morbidity & Mortality	1	1	0.7
Perinatal Death	1	1	0.7

DISCUSSION

In the present study, total of 120 pregnant women were evaluated. They were randomly divided into two Groups: 90 women in Group I, 30 women in Group II. The study groups were similar in view of demographic characteristics including maternal age, gravidity and gestational age.

In Group I, out of 90 women about 31(34.44%) cases were induced. In Group II, 30(100%) women were induced for oligohydramnios diagnosed on the basis of decreased AFI (<5cm). Our study is in accordance with AF Nabhan^[10] and S.Kehl et al^[13] and they also concluded that use of AFI increased the rate of diagnosis of oligohydramnios and labour induction for oligohydramnios without improving perinatal outcome. AF Nabhan^[10] states that the AFI method for fetal surveillance almost doubles the risk for induction of labour. It was observed in comparing Group I and Group II that there was significant difference in mode of delivery. AF Nabhan^[10] in Cochrane systematic review observed that when AFI was used more women had caesarean delivery for fetal distress i.e. (RR 1.46; 95% CI 1.08 to 1.96) without any improvement in perinatal outcomes. In comparing Group I and Group II there was a significant difference in the rate of LSCS between the two Groups i.e. a higher rate of LSCS for fetal distress was observed in Group II (p= 0.001). Our findings is in accordance with Cochrane Systematic Review and S.Kehl et al^[13] Moses et al^[14] study overall rate of caesarean deliveries for fetal distress was 4.8% and out of which 51% were in AFI group and 39% in MVP group and there was no difference in the neonatal outcomes for both the groups. There was a significant difference between Group I and II as 33.33% women had presence of meconium in Group II (decreased AFI) (p=0.001). SAFE Trial observed no difference in presence of meconium between the two groups. Our results are similar to S.Kehl et al^[13] who observed no difference in presence of meconium and birth weight between the two groups. However, Moses et al^[14] observed that there was no difference in the rate of meconium being present, but among the neonates with meconium, there was a higher proportion of thick meconium observed in the MVP monitored group. The mean birth weight in our study was 2.96±0.36. There was no significant difference between the birth weights of the two groups (p=0.650). There was no significant difference between the groups for Apgar Score at 1 minute and 5 minutes. NICU admission was 1.1% Vs 0% in Group I and Group II respectively (p > 0.05). There was no statistical difference between the groups. (p=0.722) There were two neonatal death due to valvular heart disease.^[15] However there was no statistical difference between the groups. (p=0.722)

CONCLUSION

Amniotic fluid index compared with the maximal vertical pocket excessively characterizes patients as having oligohydramnios, leading to an increase in obstetric interventions, without any documented improvement in perinatal mortality and morbidity. However, there was no significant difference in predictability of cesarean section for fetal distress, low Apgar score. Appropriately designed and powered studies are needed to determine the best method to evaluate the amniotic fluid volume.

Conflict of Interest

NIL

Authors contributions: All authors contributed equally in writing, editing, proof reading the manuscript, the statistical analysis was done by Dr Seema Amjad Raza.

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