

PERINATAL OUTCOME AT TERM GESTATION IN LOW AFI VERSUS NORMAL AFI: A COMPARATIVE LONGITUDINAL STUDY IN A TEACHING INSTITUTE IN MANIPUR

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Abstract

Background: Amniotic fluid index (AFI) is an index for the fetal well-being which is an estimate of the amount of amniotic fluid. During antenatal fetal surveillance, amniotic fluid assessment is a crucial barometer to know the fetal status. Low amniotic fluid has been associated with increased risk of maternal and fetal morbidity in terms of increased rate of induction of labour and operative interventions, and intrauterine growth retardation, meconium aspiration syndrome, birth asphyxia, low APGAR scores, and congenital anomalies. **Materials and Methods:** Patients with term gestation with oligohydramnios selected as cases after satisfying inclusion and exclusion criteria. Comparison group has normal AFI. Detailed history and examination done along with all required investigations. Oligohydramnios confirmed by measuring AFI. **Result:** Fetal distress was present in 42.5% of oligohydramnios whereas only 10% of normal AFI have fetal distress. IUGR was seen in 20% cases with low AFI as compared to 2.5% cases with normal AFI. Low birth weight baby was more in low AFI group of population 27.5% as compared to normal AFI population 17.5%. **Conclusion:** Oligohydramnios is being detected more often these days due to routinely performed obstetric USG. Oligohydramnios is one of the indicators of poor perinatal outcome. Oligohydramnios associated with IUGR carries a poor perinatal outcome. Oligohydramnios is a high-risk pregnancy and proper antepartum care; intensive fetal surveillance and intrapartum care are required.

INTRODUCTION

Amniotic fluid is a clear, a little yellowish liquid that surrounds the fetus during pregnancy. It is contained in the amniotic sac. While in the uterus, the fetus floats in the amniotic fluid. In the first half of pregnancy, the composition of fluid is almost identical to a transudate of plasma. But in late pregnancy, the composition is very much altered. The composition includes water 98-99% and solids (1-2%). Solid constituents are organic, inorganic and suspended particles. Amniotic fluid index (AFI) is kind of an estimate of the amount of amniotic fluid. It is an index for the fetal well-being.^[1]

Low amniotic fluid has been associated with increased risk of maternal morbidity in terms of increased rate of induction of labour and operative interventions, and intrauterine growth retardation, meconium aspiration syndrome, birth asphyxia, low

APGAR scores, and congenital anomalies. The amniotic fluid aids the developing fetus to move in the uterus, which allow for appropriate bone growth, the lungs to develop well, maintain a relatively stable temperature around the fetus, defends from and outside injury and heat loss by cushioning sudden blows or movements. Amniotic fluid is an essential factor in the prophecy of fetal survival. Among the innumerable list of biochemical and biophysical techniques that have been developed in recent years to predict and to improve perinatal outcome, ultrasound has revolutionized the practice of obstetrics, its greatest advantage being its non-invasive nature. The most frequently utilised method to predict the perinatal outcome is to measure the amount of amniotic fluid by ultrasound. Amniotic fluid reflects uteroplacental perfusion, fetal metabolism and renal excretory function. Changes in AFV is related to a wide variety of physiological and

pathological changes in fetus and mother. Clinical assessment of amniotic fluid volume is usually subjective. The amniotic fluid index is measured four quadrants technique by transabdominal ultrasonography as described by Phelan et al. The measurement and its comparison to the index is important in helping to determine fetal and maternal health. An AFI between 8-20 cm is considered normal. An AFI 5.1-8 cm is considered as borderline. An AFI <5 cm is considered as low AFI.^[2,3]

Aims and Objective

Comparison of the perinatal outcome of female with low AFI and females with normal AFI at term gestation.

MATERIALS AND METHODS

Study Design

The study is a hospital based, comparative Longitudinal study in the Department of Obstetrics and Gynecology, Jawaharlal Nehru Institute of Medical Sciences, Porompat, Manipur

Study Population

Patients admitted in department of obstetrics and gynecology at term pregnancy fulfilling all the inclusion & exclusion criteria and willing to participate in the study.

Inclusion Criteria

- Singleton pregnancy
- Term gestation

Exclusion Criteria

- High risk pregnancy
- Bad obstetrics history

- APH

Method

All eligible enrolled cases and controls will undergo routine investigation and the mother and baby observed for AFI, history for leaking per vagina, sign for foetal distress, presence of meconium passage, Reactive / Non-reactive NST, indication for caesarian section, Apgar score at birth and after 5 minutes, birth weight of baby, need for resuscitation & NICU admission for the baby.

Statistical Analysis

The data will be entered into MS excel and then transfer into SPSS-V: 22 and analyzed. The descriptive statistics like mean median, SD and proportion will be used. Analytical statistics like chi-square test will be used & if P value <0.05 it will be significant.

Ethical Concerns

The study was carried out after approval from IEC, JNIMS, Imphal. An informed consent was taken from the patient and strict confidentiality was maintained.

RESULTS

Age wise classification showed that most of females with low AFI were of the age group between 20 to 25 years. Mean age among cases being 24.5 years. More number of patients belong to urban group of population, which was seen equal in both the settings, cases as well as controls. Most of the patient were unemployed in both case as well as control group. Majority of patients in study group belongs to lower class (50%). In the control group also, most were from lower class (62.5%).

Table 1: Distribution of female cases and control at term gestation with their demographic profiles.

Demographic profiles		Cases (N=40)		Control (N=40)		p-value
		N	%	N	%	
Age wise	15-20 yrs	09	22.5	07	17.5	0.696
	20-25 yrs	14	35.0	13	32.5	
	25-30 yrs	09	22.5	11	27.5	
	30-35 yrs	05	12.5	04	10.0	
	35-40 yrs	03	7.5	05	12.5	
Residence	Rural	21	52.5	21	52.5	1.000
	Urban	19	47.5	19	47.5	
Educational status	Illiterate	05	12.5	03	7.5	0.744
	<XII	21	52.5	23	57.5	
	>XII	14	35.0	14	35.0	
Economic status	Lower	20	50.0	25	62.5	0.418
	Middle	11	27.5	10	25.0	
	Upper	09	22.5	05	12.5	

Table 2: Distribution of female cases and control at term gestation with their outcomes.

Outcomes Characters		Cases(N=40)		Control(N=40)		p-value
		N	%	N	%	
AFI	<5	23	57.5	0		0.004*
	5-8	17	42.5	0		
	>8	0	0.0	40	100	
Gravida	PRIMI	22	55.0	15	37.5	0.116
	MULTI	18	45.0	25	62.5	
Period of gestation	37-38 weeks	07	17.5	06	15.0	0.756

	38-39 weeks	10	25.0	13	32.5	
	39-40 weeks	23	57.5	21	52.5	
Presenting complain	None	19	47.5	01	2.5	0.000*
	Leaking PV	10	25.0	12	30.0	
	Decrease Fetal movement	06	15.0	05	12.5	
	Pain abdomen	03	7.5	21	52.5	
	Others	02	5.0	01	2.5	
Previous history of Oligohydramnios	No	17	42.5	23	57.5	0.287
	Yes	02	5.0	03	7.5	
	NA	21	52.5	14	35.0	
Induction	No	31	77.5	22	55.0	0.033*
	Yes	09	22.5	18	45.0	
Fetal Distress	No	23	57.5	36	90.0	0.002*
	Yes	17	42.5	04	10.0	
NST	No reactive	9	22.5	04	10.0	0.225
	Reactive	31	77.5	36	90.0	
IUGR	No	32	80.0	39	97.5	0.029*
	Yes	08	20.0	01	2.5	
Mode of delivery	NVD INSTRUMENTAL	07	17.5	19	47.5	0.003*
		03	7.5	06	15.0	
	LSCS	30	75.0	15	37.5	

*p-value< 0.05, Significant.

Table 3: Distribution of female cases and control at term gestation with their baby's outcomes

Baby's condition		Cases (N=40)		Control (N=40)		p-value
		N	%	N	%	
Birth Weight	1.5-2.5 kg	11	27.5	07	17.5	0.284
	>2.5 kg	29	72.5	33	82.5	
Presence of GCS	No	37	92.5	40	100	0.374
	Yes	03	7.5	0	0.0	
APGAR score	7-10	30	75.0	36	90.0	0.174
	4-6	09	22.5	03	7.5	
	<3	01	2.5	01	2.5	
Still-birth	No	40	100	39	97.5	1.00
	Yes	0	0.0	01	2.5	
Neonatal death	No	37	92.5	39	97.5	0.132
	Yes	03	7.5	0	0.0	
	NA	0	-	1((IUD)	2.5	
MECONIUM STAIN	No	20	50.0	34	85.0	0.000*
	Yes	20	50.0	06	15.0	
Resuscitation	No	31	77.5	36	90.0	0.225
	Yes	09	22.5	04	10.0	
NICU ADMISSION	No	25	62.5	35	87.5	0.011*
	Yes	15	37.5	04	10.0	
	NA	0	0.0	01(IUD case)	2.5	

*p-value<0.05, Significant

Among low AFI population 57.5% have severe oligohydramnios 42.5% of low AFI have borderline oligohydramnios. Most of the patients were primiparous (55%) in study group. In control group majority were multipara. Most pregnancies in study group were delivered at 39-40 completed weeks (57.5%). In control group also, most pregnancies were delivered by 39-40 completed weeks. (52.5%). The results were statistically insignificant.

The mean gestational age among patients 38.9 wks. Compared to normal AFI group of population, In the low AFI group of population, maximum presented with no complains and oligohydramnios was accidentally diagnosed in routine USG, which was significant. 25% among low AFI group presented with leaking PV, 30% in normal AFI group presented with the same complain. Decreased fetal movement complained by 15% in low AFI group of population, and 12.5% in normal AFI group. Only 7.5% of patients were admitted with complain of pain abdomen in low AFI population whereas in normal

AFI majority (62.5%) were admitted with pain abdomen. It was statistically significant. Only 5% of low AFI group were having previous history of oligohydramnios. 7.5% of control group has previous history of oligohydramnios. Induction was not done in 77.5% of oligohydramnios case, it was done only in 22.5% cases, whereas in control group of population induction was done in 45% of population. The difference in induction of labour of both the group was statistically significant with p value of <0.033. 57.5% of baby with oligohydramnios were not having fetal distress. NST was reactive in 77.5% in case of females with low AFI. In case of normal AFI group it was reactive in 90% population Fetal distress was present in 42.5% of oligohydramnios whereas only 10% of normal AFI have fetal distress. The difference was statistically significant.

IUGR was seen in 20% cases with low AFI as compared to 2.5% cases with normal AFI. IUGR was not seen in 97.5% of cases with normal AFI, and in 80% cases with low AFI. The difference was

significant. Majority of patient (75%) with low AFI underwent LSCS (75%) and only 37.5% of normal AFI underwent LSCS. Only 17.5% in low AFI population were delivered by vaginal delivery, whereas it was 47.5% in control group. Instrumental delivery was more in normal AFI group 15% it was 7.5% in low AFI population. The difference was significant.

Low birth weight baby were more in low AFI group of population 27.5% as compared to normal AFI population 17.5%. 7.5% babies in low AFI group were having some gross congenital anomaly. APGAR score 7-10 was seen in 75% of low AFI population whereas it is 90% in normal AFI group of population. APGAR 4-6 was seen more in low AFI population 22.5% as compared to 2.5% in normal AFI group. There were 3 early neonatal death in group with low AFI. None were seen in normal AFI population. 50% of low AFI group population had liquor meconium stained. Only 15% of normal AFI population has meconium stain liquor. his result was statistically significant. Resuscitation was required in 22.5% baby among cases, it was required only in 10% cases with normal AFI group. NICU admission was needed in 37.5% cases with low AFI. It was required only in 10% cases in normal AFI group. The difference was statistically significant

DISCUSSION

In our study maximum females belong to age group 20 to 25 years, with mean maternal age being 24.8 years. In Casey et al, the mean maternal age was 23.9 years which is comparable to the present study. Similarly mean maternal age was 22.4yrs among cases in a study done by Biradar KD et al.^[4,5]

Present study showed 55% of the patient were primigravida. In Donald D et al., the incidence of oligohydramnios was 60% in primigravida which is comparable to our study. In the study done by Ashish Prajapat et al., the highest percentage of women in the study group and control groups (64% & 63 % respectively) were primigravida. Garmel et al., supported that 67 % of women with oligohydramnios were primigravida and Charu et al, supported that 66 % of women were primigravida.^[6]

Among the cases in the present study NST was reactive in 77.5% and non-reactive in 22.5%. in control group it was reactive in 90% and was non-reactive in 10%. P Vasanthamani et al, did similar research and found that in study group about 67% had reactive NST & 33% had non-reactive NST. In Control group 84% had Reactive NST, 16% had Non-reactive NST. Most of the babies delivered in cephalic presentation (87.5% in low AFI and 90% in normal AFI). Breech was seen in 12.5% in low AFI and 7.5% in normal AFI. In a study done by Bansal et al., breech presentation was seen in 10.5% of cases.^[7,8]

In the present study APGAR score at birth <7 was seen in 25% of cases. In study by Sowmya K et al.,

Apgar score <7 seen in 14%. Another study by Madhavi K et al., found 20% had Apgar score less than 7. 3 babies (7.5%) in low AFI group showed presence of gross congenital anomaly. This was consistent with the study of Ghosh et al, in which congenital anomalies were present in 7.3% babies having low AFI.^[9]

In the study of Gita Guin et al, incidence of congenital anomalies was 8.5%. In the present study 3 neonatal death were reported in patient with low AFI (7.5%). Similar results were by Ghosh et al, where number of neonatal death was 7.3% in the study population. Jayati Nath, Maneesha Jain, Rehana Najam 22 found neonatal death to be 1.2% cases in their study.^[10]

CONCLUSION

Oligohydramnios is being detected more often these days due to routinely performed obstetric USG. Oligohydramnios is one of the indicators of poor perinatal outcome. Oligohydramnios with reactive NST is associated with good prognosis while oligohydramnios with nonreactive NST needs careful monitoring and results in early delivery, increased incidence of caesarean delivery for fetal distress, NICU admission, low APGAR score at 5 mins, and neonatal death. Mode of delivery depends on severity of oligohydramnios and status of fetal wellbeing. Caesarean section is mostly required for cases with oligohydramnios with intrapartum fetal heart abnormalities. From this study, we conclude that oligohydramnios is a high-risk pregnancy and proper antepartum care, intensive fetal surveillance and intrapartum care are required in patient with oligohydramnios. Every case of oligohydramnios needs careful antenatal evaluation, parental counseling, individualization, decisions regarding time and mode of delivery. Continuous intrapartum fetal monitoring and good neonatal care are necessary for better perinatal outcome.

REFERENCES

1. D. C. Dutta, A text book of Obstetrics including perinatology & contraception. 8th Edition, p 218
2. Winter TC, Sanders, Roger C. Clinical Sonography:A Practical Guide. Hagerstown, MD: LippincottWilliams and Wilkins. ISBN 0-7817-4869- 0.2006:502.
3. Bansal D, Deodhar P. A clinical study of maternal and perinatal outcome in oligohydramnios. J Res Med Den Sci. 2015;3(4):312-6.
4. Williams Obstetrics. Cunningham FG, Gant NF, Leveno KJ, Gilstrap LC III, Hauth JC, Wenstrom KD: 21st Edition USA; McGraw Hill. Fetal Growth and Development. Chapter 7:142-3.
5. Ghosh R et al. Int J Reprod Contracept Obstet Gynecol. 2018 Mar;7(3):907-910
6. Dr. P Vasanthamani, Dr. S Meenakshi, Dr. C Ponnuraja, S Padmanaban. A study on perinatal outcome in oligohydramnios. Int J Clin obstet Gynaecol 2020;4(1):39-41. DOI: 10.33545/gynae.2020.v4.i1a.440
7. Biradar KD et al. Int J Reprod Contracept Obstet Gynecol. 2016 Jul;5(7):2291-2294

8. Hanafy M., (2003): Impact of isolated oligohydramnios on maternal and fetal perinatal period and out come. Assuit university; 2003.
9. Kahkhaie Kolsoum Rezaie; Keikha Fateme; Khadije Rezaie Keikhaie, et al, (2014): Perinatal Outcome after Diagnosis of Oligohydramnious at Term; Iran Red Crescent Med J. 2014 May; 16(5): e11772
10. Voxman EG, Tran S, Wing DA (2012): Low amniotic fluid index as a predictor of adverse perinatal outcome. Journal of Perinatology 2002; 22: 282-85.66.