



ISSN (P): 2522-6614
ISSN (E): 2522-6622
© Gynaecology Journal
www.gynaecologyjournal.com
2021; 5(1): 368-372
Received: 28-11-2020
Accepted: 30-12-2020

Dr. Katta Aravinda
Associate Professor of Obstetrics &
Gynaecology, Katuri Medical
College and Hospital,
Chinakondrupadu, Guntur,
Andhra Pradesh, India

Dr. Batchu Surekha Naidu
Post Graduate of Obstetrics &
Gynaecology, Katuri Medical
College and Hospital,
Chinakondrupadu, Guntur,
Andhra Pradesh, India

Corresponding Author:
Dr. Katta Aravinda
Associate Professor of Obstetrics &
Gynaecology, Katuri Medical
College and Hospital,
Chinakondrupadu, Guntur,
Andhra Pradesh, India

A comparative study of perinatal outcome in pregnancies complicated with isolated oligohydramnios and oligohydramnios with intrauterine growth restriction

Dr. Katta Aravinda and Dr. Batchu Surekha Naidu

DOI: <https://doi.org/10.33545/gynae.2021.v5.i1f.842>

Abstract

Objective: To study the perinatal outcome in pregnancies complicated with isolated oligohydramnios and oligohydramnios with intrauterine growth restriction (IUGR).

Materials and Methods: A prospective comparative study of perinatal outcome in pregnancies complicated with isolated oligohydramnios (Amniotic fluid index (AFI) <8) and oligohydramnios with IUGR (fetal weight < 10th percentile) was carried out in women between 28-40 weeks of gestation in KMCH, Guntur in a period of March 2018-Jan 2020 with a sample of 50 cases with isolated oligohydramnios (AFI <8) and 50 cases with oligohydramnios with IUGR with statistical analysis based on chi-square test.

Results: In our study, perinatal outcome in isolated oligohydramnios 90% of babies with APGAR scores > 8 and 28% of babies requiring NICU admission, perinatal mortality is 2%. Perinatal outcome in oligohydramnios with IUGR showing 26% of babies APGAR<7 and NICU admission seen in 48%. Perinatal mortality was 14%.

Conclusion: Isolated decreased AFI after 37 weeks of gestation was having better prognosis when compared to oligohydramnios complicating with IUGR. Intense fetal surveillance and proper antepartum and intrapartum care in oligohydramnios can reduce the complications.

Keywords: oligohydramnios, intrauterine growth restriction (IUGR), Amniotic fluid index (AFI), meconium stained liquor

1. Introduction

Adequate amount of amniotic fluid is essential for normal growth of the fetus as it cushions against all sorts of trauma and agitations. It has bacteriostatic properties and prevents infection and it functions as primary source of fetal nutrients. After 40 weeks, there is a progressive decrease of amniotic fluid volume (AFV) at a rate of 8% per week and AFV averaging about 400 ml at 42 weeks [1]. Clinical picture of reduced amniotic fluid is oligohydramnios. Isolated oligohydramnios occurs in late pregnancy without any other risk factors and diagnosed incidentally in ultrasound. Oligohydramnios is termed when amniotic fluid is diminished less than 3rd or 5th percentile for gestational age [2]. The prevalence depends largely upon the definition and criteria used for oligohydramnios and population studies [3]. The present study is to compare the perinatal outcome in 28-40 weeks pregnancies complicated with isolated oligohydramnios (AFI <8) and oligohydramnios with IUGR.

IUGR is a condition where fetus fails to achieve its genetic potential, leading to perinatal morbidity and mortality. It is commonly associated with oligohydramnios as uteroplacental insufficiency common in both. Increased perinatal morbidity and mortality could be because of the umbilical cord compression, potential uteroplacental insufficiency and increased incidence of meconium stained amniotic fluid and oligohydramnios [4, 5]. However, some of the recent studies have shown no effect of isolated oligohydramnios in perinatal outcome [6]. Decrease of amniotic fluid volume and IUGR is associated with increase labour induction, stillbirth, non-reassuring fetal heart pattern, meconium aspiration syndrome and neonatal death [7].

2. Materials and Methods

A prospective comparative study of perinatal outcome in pregnancies complicated with isolated

oligohydramnios (AFI<8) and oligohydramnios with IUGR was carried out in women between 28-40 weeks of gestation admitted in Katuri Medical College & Hospital (KMCH) from March 2018-Jan 2020 in Guntur. An informed consent was taken from study group, detailed history, examination and investigation done, per speculum and per vaginal examination done to see any rupture of membranes, necessary investigation done, non-stress test done, USG done for fetal well-being and AFI measured by the four quadrant technique. Fetal biometry and Doppler velocimetry is done to access IUGR and abnormal uterine blood flow.

Accordingly, the patients are grouped; 50 cases of isolated oligohydramnios and 50 cases of oligohydramnios with IUGR. Patients were followed by observing NST at term; any induction of labour, mode of delivery, if delivered by cesarean section, the indication was recorded. Baby’s condition assessed by birth weight, APGAR score, colour of liquor and need for neonatal admission. Babies are followed till 28 days after birth.

2.1 Statistical technique: Chi-square test of significance is used.

2.2 Inclusion criteria

1. AFI < 8.
2. Singleton pregnancy.
3. Cephalic, breech and transverse presentations.
4. 28-40 weeks of gestation period.

2.3 Exclusion criteria

1. Multiple pregnancy
2. Pregnancies complicated with medical illness like gestational diabetes, preeclampsia, severe anemia, liver disorders and heart diseases.

3. Results

Present study is the outcome of pregnancies with AFI < 8 and compared to that of complicated with IUGR.

3.1 Indication of cesarean section

The indications for cesarean section were shown in the table no. 1.
Main indication for cesarean section was fetal distress in both groups, 63.3% in IUGR and 43.3% in isolated oligohydramnios group.

Table 1: Indication of caesarean section

Indications of caesarean	Group				Total Frequency	Total Percentage
	Isolated Oligohydramnios		Oligohydramnios with IUGR			
	Frequency	Percentage	Frequency	Percentage		
AFI:0	0	0%	1	3.3%	1	1.7%
AFI:1	1	3.3%	0	0%	1	1.7%
Breech	2	6.7%	0	0%	2	3.3%
CPD	3	10%	0	0%	3	5%
Failed Induction	0	0%	6	20%	6	10%
Fetal Distress	13	43.3%	19	63.3%	32	53.3%
PROM in Labour	1	3.3%	0	0%	1	1.7%
Relative CPD	1	3.3%	0	0%	1	1.7%
Scar Tenderness	8	26.7%	4	13.3%	12	20%
Severe Oligo AFI:2	1	3.3%	0	0%	1	1.7%
Total	30	100%	30	100%	60	100%

Chi-square: 18.458; P value: 0.030* statistically significant.

3.2 Birth weight: About 38% babies with oligohydramnios with IUGR group were below 2 kgs and only 4% of babies in that of

isolated oligohydramnios. Birth weight of the babies in both groups are depicted in the table no. 2.

Table 2: Birth weight

Birth weight category	Group				Total Frequency	Total %
	Isolated Oligohydramnios		Oligohydramnios with IUGR			
	Frequency	%	Frequency	%		
> 3KGS	19	38.0%	2	4.0%	21	21.0%
2.5-2.99 KGS	19	38.0%	12	29.0%	31	31%
2.0-2.49 KGS	10	20.0%	17	34.0%	27	27.0%
< 1.99 KGS	2	4.0%	19	38.0%	21	21.0%
Total	50	100%	50	100%	100	100%

Chisquare: 30.919; P value: 0.001* statistically significant.

3.3 Apgar score: In isolated oligohydramnios, 10% of babies had APGAR < 7at 5 minutes and while in oligohydramnios with

IUGR 26% of babies. APGAR score of the babies in both groups depicted in the table no. 3.

Table 3: Apgar score

Apgar Score	Group				Total Frequency	Total %
	Isolated Oligohydramnios		Oligohydramnios with IUGR			
	Frequency	%	Frequency	%		
< 7	5	10%	13	28%	18	18%
>8	45	90%	37	74%	82	82%
Total	50	100%	50	100%	100	100%

Chi-square: 4.336; P value: 0.033* statistically significant.

3.4 Non stress test: NST was found to be non-reactive in 28% of babies with only oligohydramnios, while that of 58% of

babies with both oligohydramnios and IUGR. Details of NST in both groups depicted in table no. 4.

Table 4: Non stress test

NST	Group				Total Frequency	Total %
	Isolated Oligohydramnios		Oligohydramnios with IUGR			
	Frequency	%	Frequency	%		
Non-Reactive	14	28.0%	29	58.0%	43	43.0%
Reactive	36	72.0%	21	42.0%	57	57.0%
Total	50	100%	50	100%	100	100%

Chi-square: 9.180; P value: 0.002* statistically significant.

Neonatal outcome: Perinatal mortality found to be more in IUGR group i.e., 14%. NICU admissions were 28% in isolated

oligohydramnios and 48% in oligohydramnios with IUGR. Neonatal outcome of the both groups are shown in the table no.5

Table 5: Neonatal outcome

NICU Admission	Group				Total Frequency	Total %
	Isolated Oligohydramnios		Oligohydramnios with IUGR			
	Frequency	%	Frequency	%		
Dead	1	2.0%	7	14%	8	8%
No	35	70%	19	38%	54	54%
Yes	14	28%	24	48%	38	38%
Total	50	100%	50	100%	100	100%

Chi-square: 11.872; P value: 0.003* statistically significant.

Concised table (table no. 6) of perinatal outcome in isolated oligohydramnios showing 90% of babies with APGAR score > 8 and 28% of babies requiring NICU admission. Perinatal mortality is 2%.

seen in 48%.

Table 6: Isolated Oligohydramnios

		NST		Total
		Non-reactive	Reactive	
Mode of Delivery	Caesarean Delivery	13	17	30
		92.9%	47.2%	60%
NVD		1	19	20
		7.1%	52.8%	40%
Total		14	36	50
		100%	100%	100%
Apgar Score	<7	3	2	5
		21.4%	5.6%	10%
>8		11	34	45
		78.6%	94.4%	90%
Total		14	36	50
		100%	100%	100%
NICU Admission	Dead	1	0	1
		7.1%	0%	2%
	No	6	29	35
		42.9%	80.6%	70%
Yes		7	7	14
		50%	19.4%	28%
Total		14	36	50
		100%	100%	100%
Deaths	0	14	35	49
		100%	97.2%	98%
1		0	1	1
		0%	2.8%	2%
Total		14	36	50
		100%	100%	100%

P value for mode of delivery is 0.03* APGAR score 0.126, NICU admission is 0.019* and deaths is 1.00.

Concised table (table no. 7) of perinatal outcome in Oligohydramnios with IUGR showing 26% of babies with APGAR <7. Perinatal mortality was 14%. NICU admission were

Table 7: Oligohydramnios with IUGR

		NST		Total
		Non-Reactive	Reactive	
Mode of Delivery	Cesarean Delivery	18	12	30
		62.1%	57.1%	60%
NVD		11	9	20
		37.9%	42.9%	40%
Total		29	21	50
		100%	100%	100%
Apgar Score	<7	10	3	13
		34.5%	14.3%	26%
>8		19	18	37
		65.5%	85.7%	74%
Total		29	21	50
		100%	100%	100%
NICU Admission	Dead	7	0	7
		24.1%	0%	14%
	NO	10	9	19
		34.5%	42.9%	38%
Yes		12	12	24
		41.4%	57.1%	48%
Total		29	21	50
		100%	100%	100%
Deaths	0	29	21	50
		100%	100%	100%
1		0	0	0
		0	0	0
Total		29	21	50
		100%	100%	100%

P value for mode of delivery is 0.776, APGAR score is 0.191, NICU admission is 0.052*.

4. Discussion

Oligohydramnios, AFI <8 cm with IUGR is associated with increased perinatal morbidity and mortality when compared to isolated oligohydramnios. In multiple studies oligohydramnios has been correlated with increased risk of abnormal fetal heart rate [8, 9, 10, 11]. Pulmonary hypoplasia [12, 13]. Increased risk of

cesarean delivery [8], IUGR [10, 14], postdated pregnancy, meconium passage, lower APGAR score [7], NICU and neonatal deaths [11]. Meconium stained liquor, low birth weight, low APGAR, NICU admissions, perinatal mortality are more frequent in IUGR group when compared to isolated oligohydramnios.

Casey and coworkers [15] studied pregnancy outcomes in oligohydramnios at or beyond 34 weeks of gestation in 147 cases and found that oligohydramnios was associated with increase in labour induction (42% vs 18%), non-reassuring heart rate (48% vs 39%), NICU admission (7% vs 2%), meconium stained amniotic fluid (1% vs 0.1%), neonatal death rate (5% vs 0.3%).

In this present study perinatal outcome in 50 cases AFI <8cm and 50 cases of AFI <8 with IUGR are studied. In both groups 20 patients had vaginal delivery and 30 patients had LSCS. There was no significant difference between them though induction was done in cases going in postdates and abnormal Doppler studies in IUGR. Induction was done with dinoprostone 0.5 mg gel or misoprostol 25 micro grams depending on the bishops score of cervix. In the group of isolated oligohydramnios, only 38% of cases were induced, indication were mostly postdates, but in IUGR group 46% were induced due to abnormal Doppler i.e. decreased diastolic flow in the umbilical artery, absent flow or reversed flow or increased flow in the middle cerebral artery. All the women admitted at term or in labour subjected to non-stress test to look for fetal heart acceleration and to rule out fetal distress. Patients are subjected to induction of labour or cesarean section based on the indication. Newborns are attended by pediatrician at time of birth, dry stimulation was enough in the babies in IUGR group needed resuscitation and NICU admission.

Magnan EF and colleagues [16] done a prospective longitudinal study on peripartum outcome of high risk pregnancies complicated by oligohydramnios and concluded that the fetuses of pregnancies complicated by oligohydramnios had a greater risk of labour induction, IUGR and preterm delivery. Oligohydramnios definition varies with different techniques of measuring AFV and different investigation. In present study AFI is taken as <8 to select antenatal women to categorize as Oligohydramnios. Jeng *et al.* [17] proposed a cut off value of 8cm demonstrating increased incidence of meconium staining, cesarean delivery for fetal distress, abnormal fetal heart rate pattern and APGAR score of 7 or less at one minute when AFI<8.

4.1 Oral and Intravenous hydration therapy

Hydration with water reduces maternal plasma osmolality and increased uteroplacental perfusion and then increases amniotic fluid volume. Treatment of maternal dehydration with oral or intravenous rehydration has been shown to increase amniotic fluid volume by 30%.¹⁸ Long term oral hydration was found to be more effective when compared to intravenous. L-Arginine sachets are another strategy as it is a potent vasodilation and increase uteroplacental blood flow and increase AFV. Sildenafil citrate is emerging drug for treatment of fetal growth restriction. It relaxes muscles in the wall of blood vessels and increases blood flow. It is used in low dose 25mg thrice daily. It improves perinatal outcome in pregnancies complicated with IUGR and severe oligohydramnios. IUGR is a condition where the fetus fail to achieve its genetic potential and consequently is at risk of increased perinatal morbidity and mortality among the number of causes of IUGR, Uteroplacental insufficiency is one of the most common cause being same reason leading to

oligohydramnios, there is a common association of oligohydramnios and IUGR. In a study by Dalal N *et al.*¹⁹ 61% cases of IUGR, which shows significant correlation between oligohydramnios and IUGR.

5. Conclusion

This study concludes that isolated decreased AFI after 37 weeks of gestation was having better prognosis when compared to oligohydramnios with IUGR. Determination of AFI can be used as an adjuvant to other fetal surveillance and proper antepartum and intrapartum care. In presence of oligohydramnios with IUGR non-reactive non stress test, meconium stained amniotic fluid, fetal distress induction of labour rate, caesarean section rate and perinatal mortality rate are more. Due to intrapartum complications and high rate of perinatal morbidity and mortality, rates of caesarean section are rising. Decision making between vaginal delivery and caesarean section should be balanced so that unnecessary maternal morbidity is prevented. Sometimes intervention can be done to decrease perinatal morbidity and mortality.

6. References

1. Cunningham Leveno, Bloom Dashe, Hoffman Casey. Spong Disorders of Amniotic Fluid Volume. In: Williams Obstetrics 25th edition. United States of America: McGraw Hill 2010, 230.
2. Renu Misra. Hydramnios and Oligohydramnios. In: Ian Donald' practical obstetric problems. 7th edition. New Delhi: BI Publications Pvt. Ltd 2012, 380.
3. Hill LM, Breckle R, Wolfgram KR, O'Brien PC. Oligohydramnios; ultrasonically detected incidence and subsequent fetal outcome. Am J Obstet. Gynecol 1983;147:407-1.
4. Magann EF, Kinsella MJ, Chauhan SP, McNamara IVIF, Gehring BW, Morrison JC. Does an amniotic fluid index of < 5 affect the outcome. Am J Obstet Gynecol 1999, 180.
5. Sherer DM. A Review of amniotic fluid dynamics and the enigma of isolated oligohydramnios. Am J Perinatol 2002; 19:253-66.
6. Hassan AA. The role of amniotic fluid index in the management of postdate pregnancy. J Coil Physician Surg. Pak 2005;15:85-8.
7. Casey BM, Leveno KJ. Pregnancy outcomes after antepartum diagnosis of oligohydramnios at or beyond 34 weeks gestation. Am J Obstet. Gynecol 2000;182:909.
8. Alchalabi HA, Obeidat BR, Jallad MF *et al.* Induction of labor and perinatal outcome: The impact of the amniotic fluid index. Eur. J Obstet. Gynecol. Reprod. Biol 2006;129(2):124-27.
9. Hasegawa J, Matsuoka R, Ichizuka K *et al.* Intrapartum fetal heart rate pattern in oligohydramnios. Fetal Diagn Ther 2008;24(3):267-70.
10. Voxman EG, Tran S, Wing DA. Low amniotic fluid index as a predictor of adverse perinatal outcome. J Perinatol off J Cal Perinatal Assoc 2002;22(4):282-85.
11. Casey BM, McIntire DD, Bloom SL *et al.* Pregnancy outcomes after antepartum diagnosis of oligohydramnios at or beyond 34 weeks' gestation. Am J Obstet Gynecol 2000;182(4):909-12.
12. Chen CM, Chou HC, Wang LF *et al.* Experimental oligohydramnios decreases collagen in hypoplastic fetal rat lungs. Exp Biol Med 2008;233(11):1334-40.
13. Winn HN, Chen M, Amon E *et al.* Neonatal pulmonary hypoplasia and perinatal mortality in patients with

- midtrimester rupture of amniotic membranes-a critical analysis. *Am J Obstet Gynecol* 2000;182(6):1638-44.
14. Garmel SH, Chelmow D, Sha SJ *et al.* Oligohydramnios and the appropriately grown fetus. *Am J Perinatol* 1997;14(6):359-63.
 15. Casey BM, Leveno KJ. Pregnancy outcomes after antepartum diagnosis of oligo at or beyond 34 weeks gestation. *American Journal of obstetrics and gynecology* 182, 909.
 16. Magnan EF, Doherty DA, Lutgendorf MA *et al.* Peripartum outcomes of high risk pregnancies complicated by oligohydramnios. *J obstet gynaecol Res* 2010;36(2):268-77.
 17. Jeng CJ, Lee JF, Wang KG, Yang YC, Lan CC. Decreased amniotic fluid in term pregnancy-Clinical significance. *Reprod Med* 1992;37(9):789-92.
 18. Luton Alran S, Fourchette V *et al.* paris heat wave and oligohydramnios. *Am J obstet Gynecol* 2004;191(6):2103-5.
 19. Dalal N, Malhotra A. Perinatal outcome in cases of severe oligohydramnios. *Int. J Reproduct. Contracept. Obstet. Gynecol* 2019;8(4):15-39.