Original Research Article

Indian Journal of Obstetrics and Gynecology
Volume 7 Number 2 (Part - II), April - June 2019
DOI: http://dx.doi.org/10.21088/ijog.2321.1636.7219.25

Neonatal Outcomes in Women with Isolated Oligohydramnios

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How to cite this article:
Poonguzhali liston, Gomathy E, Sudha Reddy V. Neonatal Outcomes in Women with Isolated Oligohydramnios. Indian J Obstet Gynecol. 2019;7(2):267-272.

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Received on 20.02.2019; **Accepted on** 27.03.2019

Abstract

Introduction: Oligohydramnios is a serious complication of pregnancy that is associated with a poor perinatal outcome. Isolated oligohydramnios at term is defined as AFI <5 cm without any maternal or fetal cause. Incidence of isolated oligohydramnios is 0.5-1% at term. It can be used as an adjunct to other fetal surveillance method to identify those infants at risk of poor perinatal outcome.

The number of studies dealing with isolated oligohydramnios at term and its outcome in Indian setup is limited. Therefore this study is conducted to determine the perinatal outcome in cases of isolated oligohydramnios coming to R.L. Jalappa Hospital, Kolar.

Method: Consisted of analysis of pregnancy outcome in 50 cases diagnosed as oligohydramnios by ultrasound after 37 completed weeks of gestation (Cohort 1) compared with 50 controls (Cohort 2) and matched for other variables like age, parity, gestational age. Various outcomes were recorded, tabulated and analyzed.

Results: In our study occurrence of non reassuring NST, lower neonatal birth weight, low normal value of cord blood pH was higher in the study group when compared to control group. There was no statistically significant difference in the occurrence of adverse neonatal outcomes except for lower birth weight among neonates born to oligohydramnios mothers.

Conclusion: The presence of isolated oligohydramnios in the absence of other complicating maternal and fetal causes does not conclusively predict adverse perinatal outcomes.

Keywords: Neonatal ; Oligohydramnios.

Introduction

Amniotic fluid plays a major role in the fetal growth and development. It provides the fetus with a protective environment suitable for growth and development. Abnormalities of the fluid volume can interfere directly with fetal development or it may be an indirect sign of underlying disorder such as fetal hypoxia, neural tube defect or gastrointestinal obstruction.

In present practice, AFI assessed in antenatal period helps to identify women who need increased surveillance for pregnancy complications. It can also be used as an adjunct to other fetal surveillance method to identify those infants at risk of poor perinatal outcome.

Oligohydramnios is a serious complication of pregnancy that is associated with a poor perinatal outcome. Phelan defined oligohydramnios as amniotic fluid index (AFI) < 5 cm from 36-42 wks of

gestation [1]. It occurs in about 1-5% of pregnancies at term [2]. Isolated oligohydramnios at term is defined as AFI <5 cm without any antenatal maternal or fetal complications. Many studies show that isolated oligohydramnios is associated with variety of ominous perinatal outcomes, such as fetal distress, low birth weight, perinatal morbidity, perinatal mortality [3,4].

However, the above observation is refuted by studies that prove amniotic fluid index is a poor predictor of adverse outcome and even the existence of an entity like isolated term oligohydramnios has been questioned by some authors. Thus this study was conducted to determine whether antepartum AFI of 5 cm or less can be used as a predictor of adverse perinatal outcome [5,6,7,8].

Materials and Methods

This study was conducted at R L Jalappa Hospital for a period of 24 months (Novenmber 2015 to July 2017) and included the inpatients admitted to the labour ward during this period. 100 patients were included of which 50 belonged to the isolated oligohydramnios group and 50 to the control.

A. Inclusion criteria

- Low risk pregnancy with gestational age between 37 to 42 weeks with intact membranes.
- Singleton pregnancy.

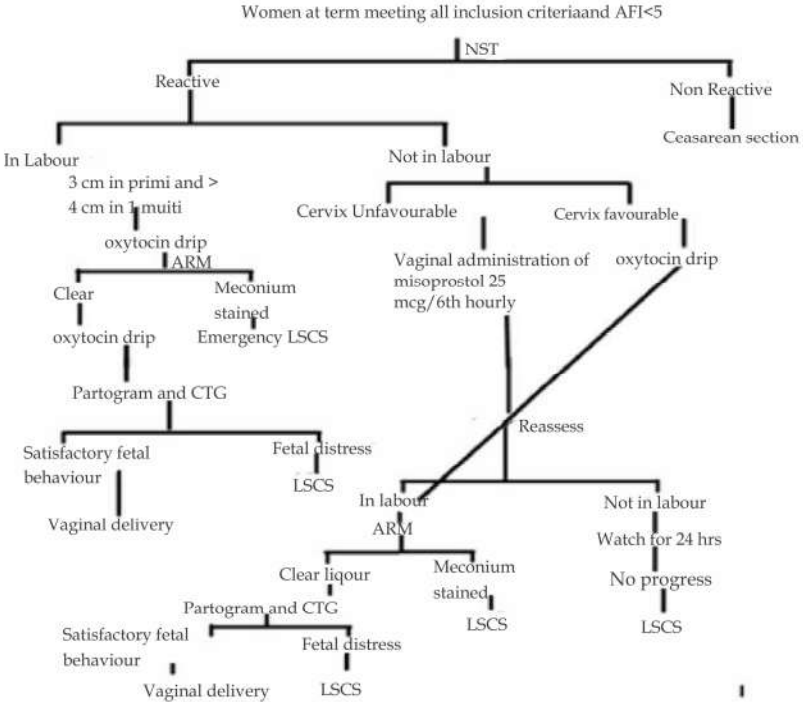
B. Exclusion criteria

- Medical disorder of pregnancies - like diabetes, hypertension, renal disease and pre-eclampsia.
- Congenital anomalies of the fetus.

Method of collection of data

- Patients were recruited after taking informed consent.
- Women with AFI < 5 / AFV <500 ml at more than 37 weeks of gestation were included in the case group and AFI > 5 cm were considered as controls.
- All cases were monitored by electronic fetal monitoring. If any fetal distress was present, operative intervention were undertaken.
- Cord blood ABG was done immediately after the birth of the baby to rule out acidosis and thus the presence of any fetal distress.

Flow Chart Showing Management Protocol for Study Group



- Birth weight, APGAR scores at 1 minute and 5 minutes was noted and baby was admitted to Neonatal intensive care unit as and when required.

Statistical Analysis

Various fetal outcomes like APGAR score of the child, NICU admission etc. were considered as outcome variables.

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Data was also represented using appropriate diagrams. Both the groups (Oligohydramnios and control) were compared with respect to all the potential confounding baseline variables. Chi square and fischer's exact test were used to test statistical significance. p value < 0.05 was considered statistically significant.

Results

Among the population included, the 50 people were controls and 50 people had Oligohydromnios. (Table 1)

Table 1: Descriptive analysis of Study group in study population (N=100)

Study group	Frequency	Percentage
Control	50	50.00%
Oligohydromnios	50	50.00%

The mean age for study group and control group were 22.54 years and 22.24 years respectively. Most of them were primigravidas and the mean gravidity was 1.3 in study group and 1.8 in control group. Only those with good dates were taken for study and all had completed 37 weeks of gestation and mean gestational age was 37.56 weeks for study and 39.36 for control group (Table 2, Fig 1).

Among the Control group was 48 (96%) had reassuring NST at admission and 2 (4%) had non-reassuring NST. The number of reassuring and non-reassuring NST was 42 (84%) and 8 (16%) in oligohydramnios group. The difference between study groups with respect to NST at admission was statistically significant (p value 0.05). Women with non reassuring NST in both study and control group at admission were taken up for caesarean.

Among the Control group 1(2%) woman each had early and variable NST pattern. Among the Oligohydramnios group 1(2%) woman each had early and late deceleration and 6(12%) women had

Table 2: Admission NST of study population (N=100)

Admission NST	Study group		Chi square	p-value
	Control (N=50)	Oligohydromnios (N=50)		
Reassuring	48 (96%)	42 (84%)	4.000	0.05
Non-reassuring	2 (4%)	8 (16%)		

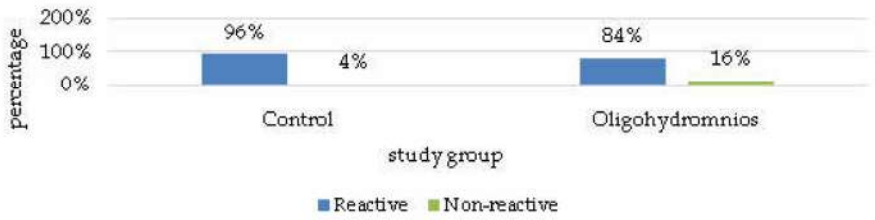


Fig 1: Bar chart of Admission NST distribution in study group (N=100)

Table 3: Distribution of NST patterns among the study population (N=100)

NST patterns	Study group	
	Control (N=50)	Oligohydromnios (N=50)
Reassuring	48 (96%)	42 (84%)
Early	1 (2%)	1 (2%)
variable	1 (2%)	6 (12%)
Late	0 (0%)	1 (2%)

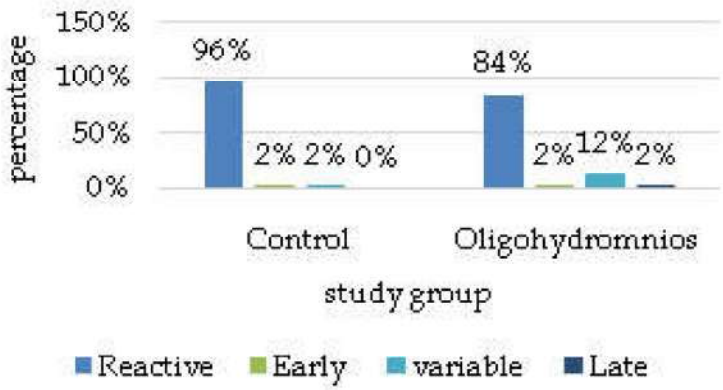


Fig 2: Bar chart of NST distribution in study population (N=100)

Table 4: Distribution of birth weight in study population (N=100)

Birth weight	Study group		Fishers' exact test Chi square	p-value
	Control (N=50)	Oligohydromnios (N=50)		
2.0-2.5 kg	15 (30%)	30 (60%)	13.44	<0.001
>2.5-3.0 kg	30 (60%)	12 (24%)		
>3.0-3.5 kg	4 (8%)	6 (12%)		
>3.5 kg	1 (2%)	2 (4%)		

Table 5: Association of Study group with Apgar at 5 min of study population (N=100)

Apgar at 5 min	Study group		Chi square	P-value
	Control (N=50)	Oligohydromnios (N=50)		
7	1 (2%)	1 (2%)	1.043	0.59
8	1 (2%)	3 (6%)		
9	48 (96%)	46 (92%)		

Table 6: Distribution of NICU admission in study population (N=100)

NICU admission	Study group		Chi square	p-value
	Control (N=50)	Oligohydromnios (N=50)		
Yes	2 (4%)	6 (12%)	2.174	0.14
No	48 (96%)	44 (88%)		

Table 7: Association of Study group with Cord blood PH of study population (N=100)

Cord blood pH	Study group		Chi square	p-value
	Control (N=50)	Oligohydromnios (N=50)		
7.20-7.24	2 (4%)	12 (24%)	8.306	<0.001
7.25-7.28	48 (96%)	38 (76%)		

variable deceleration (Table 3) (Fig 2).

Among the Control group 15 (30%) women had babies with birth weight 2.0-2.5 kg. In the Oligohydromnios group 30(60%) women had babies with birth weight 2.0-2.5 kg. The difference between groups with regards to birth weight was statistically significant (p value <0.001) (Table 4).

Among the control group 1 (2%) neonate had Apgar at 5 min of 7. The number of neonates with 8 and 9 APGAR at 5 min were 1 (2%) and 48 (96%) respectively. In the Oligohydromnios group 1 (2%) neonate had APGAR at 5 min of 7. The number of neonates with 8 and 9 as APGAR at 5 min were 3(6%) and 46 (92%) respectively. The difference between study groups with regards to APGAR at

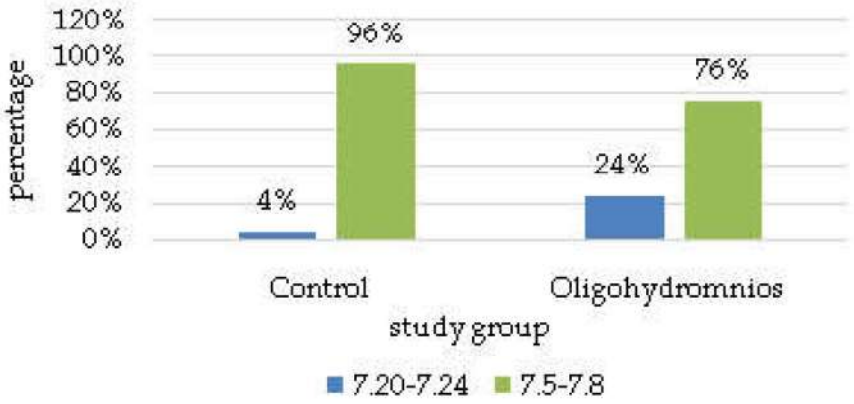


Fig 3: Bar chart of Cord blood PH between study group distribution in study group (N=100)

5 min was statistically not significant (p value 0.59) (Table 5).

Among the control group only two neonates were admitted in NICU, the number of neonates from oligohydromnios group who were admitted to NICU was 6(12%) (Table 6).

Among the control group 2 (4%) neonate had a cord blood pH of 7.20-7.24, and 48 (96%) had a cord blood pH of 7.5-7.8. In the oligohydromnios group 12 (24%) neonates had a cord blood pH of 7.20-7.24, and 48 (96%) had a cord blood pH of 7.5-7.8. The difference between study groups with regards to cord blood pH was statistically significant (p value <0.001) with 12 neonates having a cord blood pH in low normal value (Table 7).

Discussion

A prospective comparative study conducted in SDUMC, Kolar from November 2015 to July 2017, to analyze the pregnancy outcome in term isolated oligohydramnios and normal pregnancies after matching the demographic variables.

Non Stress Tests

The non reassuring NST rates were high in women with AFI <5 cm. There was statistically significant difference in the occurrence of non reassuring NST in the oligohydramnios group then control group. The rate of non reassuring NST is 40%, 69.23% and 41% in studies conducted by Kumar P et al., Chandra et al. [10], Sriya R et al. [12] respectively. In present study only 16% cases had nonreassuring NST which was less when compared to other similar study.

Birth weight

In this study it was seen that there was statistically significant difference between the birth weight of the neonates born to women with AFI <5 cm This correlated with the findings of other studies like Chandra et al. and Sriya et al. which also showed a higher rate of low birth weight babies in the study group.

APGAR score < 7 at 5 Minutes

The 5 min APGAR score <7 is seen in 2% of oligohydramnios group. Whereas 5 min APGAR less than 7 in other studies were higher. This could be due to the fact that the above mentioned studies included oligohydramnios due to high risk maternal factors also, whereas the present study included only isolated oligohydramnios.

Admission to Neonatal Ward

12% of newborns were admitted to neonatal ward for various morbidities like birthasphyxia, meconium aspiration from study group. This is comparable to studies conducted by Magann et al. [9] (7.6%) and Casey et al. [11] (7%).

Cord Blood pH

The normal range of the cord blood pH in a new born is 7.2-7.28 immediately after birth. No babies in the study population had a pH <7.20, thus proving that none of these neonates suffered from birth asphyxia which would lead to long term squealae. There was a statistically significant difference in the number of neonates in the study group which had cord blood pH in the lower end of the normal range (12% vs 2%).

Conclusion

In presence of oligohydramnios, the occurrence of non-reassuring NST, abnormal FHR tracings during labor, low 5 minute Apgar score, low birth weight and perinatal mortality were concluded to be higher by earlier studies.

In our study occurrence of non reassuring NST, lower neonatal birth weight, low normal value of cord blood pH was higher in the study group when compared to control group. There was no statistically significant difference in the occurrence of adverse neonatal outcomes except for lower birth weight among neonates born to oligohydramnios mothers. Only the presence of isolated oligohydramnios in the absence of other complicating maternal and fetal causes does not conclusively predict adverse perinatal outcomes.

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