

A Prospective Study on Maternal and Fetal Outcome in Oligohydramnios (AFI <5cm)

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Abstract: *Background:* Decrease in amniotic fluid volume or Oligohydramnios has been correlated with increased risk of intrauterine growth retardation, meconium aspiration syndrome, severe birth asphyxia, low APGAR scores and congenital abnormalities. Early detection of oligohydramnios and its management may help in reduction of perinatal morbidity and mortality on one side and decreased caesarean deliveries on the other side. The objective of present study is to assess the effect of oligoamnios on foetal and maternal outcome at or beyond 34 weeks of gestation age with AFI < 5 cm. *Methods:* In the present study, 50 patients beyond 34 weeks of gestation age with AFI < 5 cm were included and the maternal and foetal outcome was studied. *Results:* Total number of patients included in my study was 80. Maximum number of patients was in the age group of 20 - 25 years. Incidence of oligoamnios was more in primigravida (52.5%) in my study. Most common cause of oligoamnios was idiopathic (52%). Oligoamnios was associated with intrauterine growth retardation in 11 babies (22%); APGAR SCORE <7 after 5 mins in 5 patients (10%); NICU admission in 24 patients (48%). *Conclusions:* Oligoamnios is a frequent occurrence and demands intensive fetal surveillance and proper antepartum and intrapartum care so that the perinatal mortality and morbidity and maternal morbidity can be reduced.

Keywords: oligoamnios; Maternal Outcome; Foetal Outcome; amniotic fluid index;

1. Introduction

Oligohydramnios is described as a condition with decreased amniotic fluid volume relative to gestational age. The amniotic fluid (AF) is a part of the baby's life support system. Amniotic fluid is produced soon after the amniotic sac is formed at about 12 days after conception. It is first made up of effusion that is provided by the mother's circulation and then around the 20th weeks fetal urine becomes the primary substance. If the measurement of AF is too low it is called oligohydramnios. If the measurement of AF is too high it is called polyhydramnios [1]. Oligohydramnios was defined as Amniotic fluid index (AFI) ≤ 5 (or less than the 5th percentile) or the absence of a pocket measuring at least 2×1 cm [2]. With the help of method of amniotic fluid estimation by AFI using four quadrant techniques during transabdominal USG, as per described by Phelan et al in 1997, better identification of fetus at high risk can be done [3].

Oligohydramnios is a common complication of pregnancy and the incidence of this is reported to be around 1 to 5 % of total pregnancies [4]. The accurate diagnosis of oligohydramnios has become possible by ultrasonographic examination. It can occur at any time during pregnancy, but it is most common during the last trimester. Amniotic fluid levels decrease by half once a pregnant patient reaches 42 weeks gestation. Oligohydramnios can complicate 12% of pregnancies that go past 41 weeks [5].

Usually, the degree of Oligohydramnios is proportional to the severity of placental hypoperfusion and IUGR (Intra Uterine Growth Restriction). The most likely cause of oligohydramnios in IUGR babies is decreased urine output. There are numerous maternal and foetal risk factors associated with a reduction of AFI [6].

Decreased amount of amniotic fluid, particularly in third trimester, has been associated with multiple foetal risks like

cord compression, musculoskeletal abnormalities such as facial distortion and clubfoot, intrauterine growth restriction, low birth weight, fetal distress in labour, meconium aspiration syndrome, severe birth asphyxia, low APGAR scores, NICU admission, congenital abnormalities and stillbirths [7].

The sequel from long standing oligohydramnios includes pulmonary hypoplasia, potter's syndrome, club foot and hand and hip dislocation. However, some studies done in cases of abnormal liquor volume show that amniotic fluid index is a poor predictor of adverse outcome [8, 9]. Early detection of oligohydramnios and its management may help in reduction of perinatal morbidity and mortality on one side and decreased caesarean deliveries on the other side [10].

The findings of oligohydramnios can be associated with congenital fetal abnormalities, premature rupture of membranes, uteroplacental insufficiency, growth retardation, post datism, chronic abruptio placentae, maternal illness i. e., hypertension, preeclampsia, abnormalities of twinning, history of drug intake etc. Pre - eclampsia, Intrauterine Growth Restriction (IUGR) and post - dated pregnancies are the commonest causes. Thus, this study was conducted to find out the significance of oligohydramnios in determining the maternal and perinatal outcome in pregnant women with oligohydramnios during third trimester of pregnancy.

Objective of the study

To assess the effect of oligoamnios on foetal and maternal outcome at or beyond 34 weeks of gestation age with AFI < 5 cm.

2. Methodology

- **Study Design:** Prospective study
- **Study Duration:** 12 months (September 2018 - March 2019)

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- **Study Area:** Kempegowda Institute of Medical Sciences, Bangalore.
- **Study Participants:** Patients beyond 34 weeks of gestation age with AFI < 5 cm attending Kempegowda Institute of Medical Sciences, Bangalore.

Inclusion Criteria

- 1) Amniotic fluid index ≤5.0 cm for the women with oligohydramnios
- 2) Singleton cephalic foetus.
- 3) No gross foetal anomalies
- 4) Antenatal patients in their third trimester
- 5) Alive baby.

Exclusion Criteria

- 1) Premature rupture of membranes,
- 2) Twins and multiple pregnancies.
- 3) Antenatal patients before third trimester
- 4) Intrauterine death of foetus.

Method of Data Collection

Patients beyond 34 weeks of gestation age with AFI < 5 cm attending BGS Global Institute of Medical Sciences, Bangalore were included in the study till the sample size was reached. Clearance from the institutional ethical committee was taken before starting the study. Study participants were included in the study by Purposive Sampling technique.

Written informed consent was taken from the study participants before collecting the data. A pre - tested, semi - structured questionnaire was used to collect information on socio - demographic variables and obstetric history by interview method. A thorough clinical examination was done. Oligohydramnios was confirmed by measuring AFI. Routine management in form of rest, left lateral position, oral and intravenous hydration and control of etiological factor was done if present. Fetal surveillance was done by USG, modified Biophysical profile and Doppler. Decision of delivery by either induction or elective or emergency LSCS was done as per required. Some patients were already in labour and others allowed to go in spontaneous labour. Cases were than studied for maternal and foetal outcome.

Estimation Of Sample Size:

On the basis of statistics obtained from Department of OBG, Kempegowda Institute of Medical Sciences, an average of 4 cases per month fitting the criteria of the study with study duration of 12 months, we can expect to have N=48. Based on this population size, using YAMANE equation, for a known population size, sample size (n) equal to

$$n = N/1+Ne^2$$

n=sample size

N=population size

e= margin of error (for 95% of confidence level, margin error =0.05)

$$n=48/1+48*0.05*0.05 = 48/1.12 = 42.85$$

Therefore, after approximating, the sample size of the study participants was fixed at 50.

3. Results

Table 1: Distribution of the study participants according to their age group

Age	Frequency (N)	Percentage (%)
< 20 years	4	8.0
20 - 25 years	36	72.0
25 - 30 years	7	14.0
>30 years	3	6.0
Mean + SD	23.58+3.233	

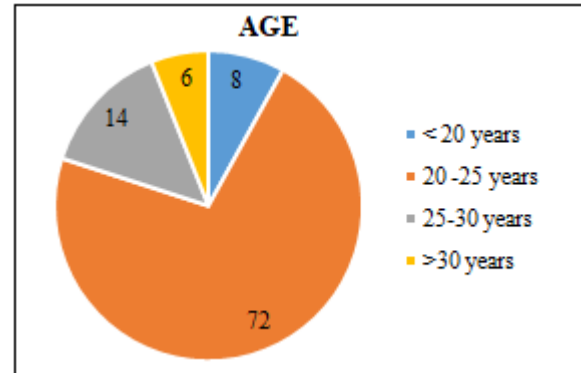


Figure 1: Distribution of the study participants according to their age group

72% of the study participants belonged to the age group 20 - 25 years of age. The mean age of the study participants was found to be 23.58+3.233years of age.

Table 2: Distribution of the study participants according to their Mode of delivery

Mode of Delivery	Frequency (N)	Percentage (%)
Vaginal Delivery	28	56.0
Caesarean Delivery	22	44.0

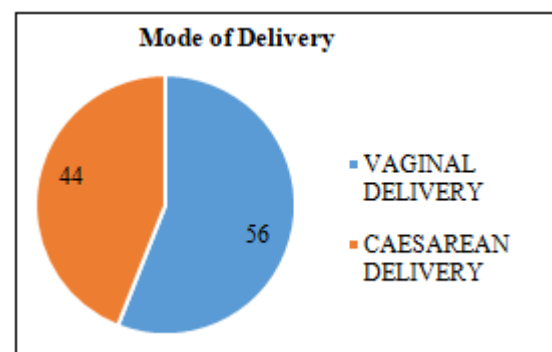


Figure 2: Distribution of the study participants according to their Mode of delivery:

56% of the study participants had vaginal delivery and 44% of the study participants underwent LSCS.

Table 3: Association of Parity with mode of delivery

Parity	Mode of Delivery		Total	
	VD	LSCS		
Primigravida	Count	16	14	30
	%	53.3%	46.7%	100.0%
Multigravida	Count	12	8	20
	%	60.0%	40.0%	100.0%
P Value		0.432		

Oligohydramnios was more common in primigravida patients (n=30). The rate of lower segment caesarean section (LSCS) was also more in primigravida patients. Out of 30 primigravida, 16 patients (53.3%) delivered vaginally and 14 patients (46.7%) had undergone LSCS. Out of 20 multiparous patients, 12 patients (60%) delivered vaginally and 8 patients (40%) had undergone LSCS.

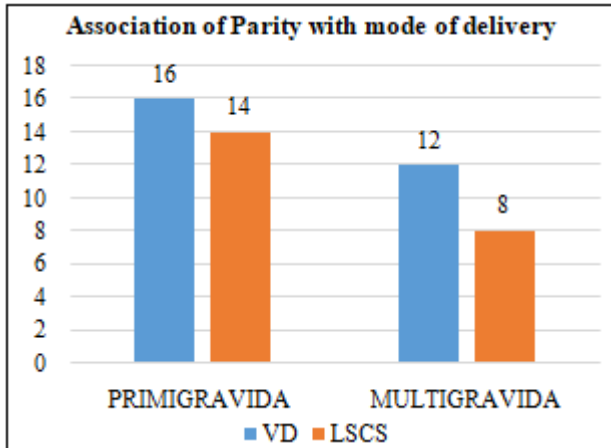


Figure 3: Association of Parity with mode of delivery

Table 4: Causes leading to oligohydramnios

Causes Leading to Oligohydramnios	Frequency (N)	Percentage (%)
Idiopathic	26	52.0
Post - Dated Pregnancy	15	30.0
PIH	6	12.0
Other Causes	3	6.0

The most common cause of oligoamnios was idiopathic which was present in 26 patients (52%).30% and 12% of the study participants were found to have oligoamnios as a result of Post - dated pregnancy and pregnancy induced hypertension respectively.

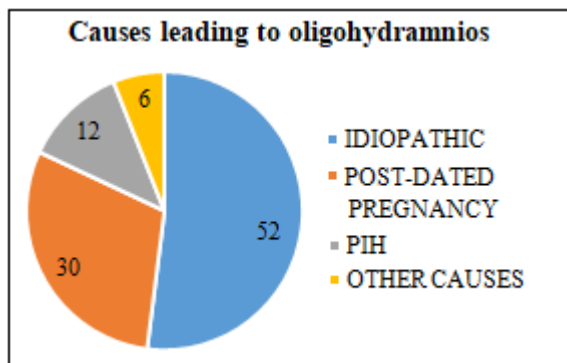


Figure 4: Causes leading to oligohydramnios

Table 5: Onset of labour

Onset of Labour	Frequency (N)	Percentage (%)
Induced Labour	20	40.0
Spontaneous Labour	30	60.0

In present study maximum number of patients went into spontaneous labour (30 patients, 60%).20 patients (42.22%) were induced either with cerviprime gel or misoprost depending upon the condition of the cervix.

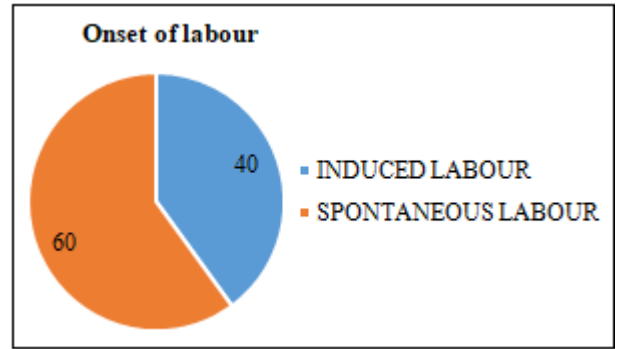


Figure 5: Onset of labour

Table 6: Association of NST with mode of delivery

Mode of Delivery		NST		Total
		R	NR	
VD	COUNT	22	6	28
	%	78.6%	21.4%	100.0%
LSCS	COUNT	11	11	22
	%	50.0%	50.0%	100.0%
TOTAL	COUNT	33	17	50
	%	66.0%	34.0%	100.0%
P VALUE		0.035		

78.6% of the study participants with normal vaginal delivery were found to have reassuring foetal heart rate in NST.50% of the study participants with LSCS were found to have reassuring foetal heart rate in NST.50% of the study participants with LSCS were found to have non - reassuring foetal heart rate NST. The association was found to be statistically significant between mode of delivery and NST.

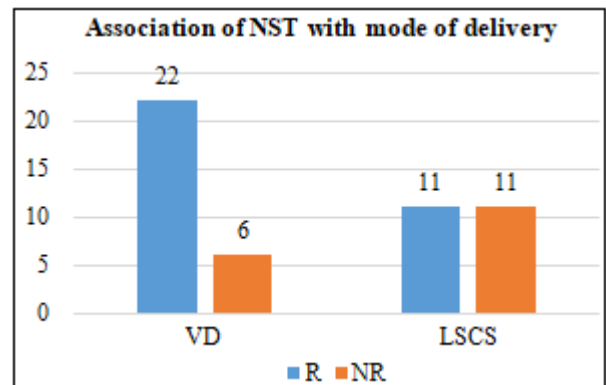


Figure 6: Association of NST with mode of delivery

Table 7: Adverse Foetal Outcomes

Adverse Foetal Outcomes	Frequency (N)	Percentage (%)
IUGR	11	22.0
APGAR score <7 after 5 mins	5	10.0
NICU ADMISSION	24	48.0

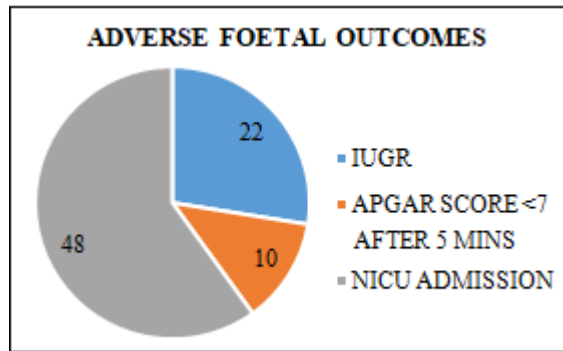


Figure 7: Adverse Foetal Outcomes

Oligoamnios was associated with intrauterine growth retardation in 11 babies (22%); APGAR SCORE <7 after 5 mins in 5 patients (10%); NICU admission in 24 patients (48%).

4. Discussion

Assessment of amniotic fluid volume during the antenatal period is considered a helpful tool in determining who is at risk for adverse neonatal outcome. Amniotic fluid volume serves as an indicator of foetal well - being. Decreased amniotic fluid volume in pregnancies without premature rupture of membranes reflects a foetus in chronic stress with shunting of blood to its brain, adrenal glands and heart and away from other organs including the kidney. Decreased renal perfusion results in decrease urinary output and oligohydramnios [11]. Thus, the evaluation of Amniotic Fluid Volume has become an integral component of fetoplacental assessment in pregnancies which are at risk for an adverse outcome of pregnancy. Hence, this study was undertaken to assess the effect of oligoamnios on foetal and maternal outcome at or beyond 34 weeks of gestation age with AFI < 5 cm.

In the present study, 72% of the study participants belonged to the age group 20 - 25 years of age. The mean age of the study participants was found to be 23.58±3.233 years of age. In a study done by Jagatia K et al [10], 67% of patients were in 20 - 25 years age group and the Mean maternal age was 23.66 years. In a study done by Kaur P et al [12], The mean age was found to be 23.2 ±3.4 years. In a study done by Ghimire S et al [13], 68% of patients were in 20 - 29 years age group. In a study done by Sangeetha K et al [14], The mean age for the study group was 23.1 years. In a study done by Kagne S et al [15], the mean age of the study population was 22.6±3.6 years. 53 (73.61%) patients belonged to the agegroup of 20 - 25 years. These findings are comparable with the findings of the present study.

In the present study, 56% of the study participants had vaginal delivery and 44% of the study participants underwent LSCS. In a study done by Kaur P et al [12], 48 % of the study participants underwent LSCS. In a study done by Sangeetha K et al [14], Number of women delivered by LSCS was 11 (22%) among oligoamnios group. In a study done by Kagne S et al [15], 44.44% of women delivered by NVD. In a study done by Bansal D et al [16], 53% of the delivery was done by normal vaginal delivery.

In the present study, Oligohydramnios was more common in primigravida patients (n=30). The rate of lower segment caesarean section (LSCS) was also more in primigravida patients. Out of 30 primigravida, 16 patients (53.3%) delivered vaginally and 14 patients (46.7%) had undergone LSCS. Out of 20 multiparous patients, 12 patients (60%) delivered vaginally and 8 patients (40%) had undergone LSCS. In a study done by Jagatia K et al [10], Incidence of oligohydramnios was more in primipara (52%). 55.78% of primigravida underwent LSCS. In a study done by Ghimire S et al [13], Incidence of oligohydramnios was more in primipara (58%) and 85% of the study participants underwent LSCS. In a study done by Sangeetha K et al [14], Maximum numbers of patients were primigravida. These findings are comparable with the findings of the present study.

In the present study, the most common cause of oligoamnios was idiopathic which was present in 26 patients (52%). 30% and 12% of the study participants were found to have oligoamnios as a result of Post - dated pregnancy and pregnancy induced hypertension respectively. In a study done by Jagatia K et al [10], Most common cause of Oligohydramnios is idiopathic (52%). Second commonest cause is PIH (25%). In a study done by Bansal D et al [16], the most common obstetric risk factors associated with oligohydramnios were found to be PIH in 42 (21%) cases and post - dated pregnancy in 34 (17%) cases.

These findings are comparable with the findings of the present study. In the present study, maximum number of patients went into spontaneous labour (30 patients, 60%). 20 patients (42.22%) were induced either with cerviprime gel or misoprost depending upon the condition of the cervix. In a study done by Kaur P et al [12], 54 % of patients were induced. In a study done by Sangeetha K et al [14], The labor was induced in 28 (56%) women with AFI ≤5 cm. In a study done by Kagne S et al [15], 61.11% of patients were induced.

In the present study, 78.6% of the study participants with normal vaginal delivery were found to have reassuring foetal heart rate in NST. 50% of the study participants with LSCS were found to have reassuring foetal heart rate in NST. 50% of the study participants with LSCS were found to have non - reassuring foetal heart rate NST. The association was found to be statistically significant between mode of delivery and NST. In a study done by Jagatia K et al [10], 68% of the study participants had reassuring foetal heart rate NST. In a study done by Kaur P et al [12], 38 % of the study participants with oligoamnios were found to have non - reassuring foetal heart rate NST. In a study done by Sangeetha K et al [14], The NST was non - reactive in 5 (10%) women with AFI <5 cm. In a study done by Kagne S et al [15], 32 (44.44%) patients had non - reassuring NST. These findings are comparable with the findings of the present study.

In the present study, Oligoamnios was associated with intrauterine growth retardation in 11 babies (22%); APGAR SCORE <7 after 5 mins in 5 patients (10%); NICU admission in 24 patients (48%). In a study done by Jagatia K et al [10], 22% of the newborns were admitted in the NICU,

18% of the newborns were found to be SGA, 15% of the newborns had APGAR SCORE <7 after 5 mins. In a study done by Ghimire S et al [13], 22% of the newborns had low APGAR score, 11% had NICU admission. In a study done by Sangeetha K et al [14], The 5 min Apgar score <7 is seen in 4% of oligohydramnios group which required NICU admission. 4% of newborns were admitted in NICU. In a study done by Kagne S et al [15], 11 babies had intrauterine growth restriction. 5 - minute APGAR score was <7 in 14.28% babies. 16 babies needed NICU admission. In a study done by Bansal D et al [16], 17.5% babies had low Apgar score. These findings are comparable with the findings of the present study.

Chronic hypoxia is already a consequence of pregnancy - induced hypertension and post - term because of distinct pathophysiology, which results in morbidity for the foetus. Because of the rise in intrauterine pressure, hypoxia is now made worse when it coexists with oligohydramnios. During labour, the uterine wall's compressive action increases. With increasing duration and intensity of the contractions, there will be temporary reduction of the blood supply, aggravating the pre - existing hypoxia that the foetus is already experiencing. The oxygen supply will be further reduced as a result. It makes the foetus more morbid throughout and after pregnancy.

5. Conclusion

In mothers with oligoamnios, to reduce the foetal morbidity, a good and vigilant antenatal check - up to diagnose the onset of pregnancy induced hypertension and treating it adequately and vigilantly is necessary in last trimester. Though it is not possible to prevent idiopathic oligohydramnios, if other foetal reasons causing oligohydramnios can be identified, preventive or curative measures can be taken with a reasonable certainty of good neonatal outcome.

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