



TO STUDY THE EFFECT OF OLIGOHYDRAMNIOS ON MATERNAL AND FETAL OUTCOMES IN 37 WEEKS OR MORE GESTATION PERIOD AT ANMMCH, GAYA, BIHAR

Gynaecology

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ABSTRACT

Background : Oligohydramnios is a threatening condition to maternal and fetal health. It is a clinical condition characterized by amniotic fluid index (AFI) of ≤ 5 cm by sonographic assessment.

Aim and objectives: The aim of this study was to compare the maternal and fetal outcome in parturient women with oligohydramnios versus others with normal amniotic fluid, and to suggest plan of action in management of oligohydramnios women. Study design: Prospective comparative observational.

Method : Antenatal women with gestational age 37 weeks and above and fulfilling inclusion criteria attending our Out Patient Department or Labour rooms were included in the present study. Detailed antenatal history including presence of high risk factors were elicited from the patients, then they were clinically examined and subjected to ultrasonography. purposive sample of 168 parturient women (84 study group and 84 control group) were taken. The tools used for data collection were; a structured interview sheet, maternal assessment sheet, Partogram, and neonatal assessment record.

Results: The results of the present study revealed that the rate of Caesarian section was significantly higher in oligohydramnios group compared to the control group (44.0% vs. 30.0% respectively). There was significant increasing in FHR decelerations, low Apgar score at 5 min, low birth weight, admission to NICU.

Conclusion: It can be concluded that an amniotic fluid index of ≤ 5 cm detected after 37 completed weeks of gestation is an indicator of poor perinatal outcome. It is recommended that determination of AFI through regular antenatal care visits can be used as an adjunct to other fetal surveillance methods to identify those infants at risk of poor perinatal outcome.

KEYWORDS

AFI, FHR, NICU, LSCS, FTND, PROM, IUGR, NST, PIH, SGA, AFV, C/S

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. The amount of amniotic fluid is maximum at 34 weeks of gestation into the pregnancy, when it averages 800 mL. About 600 mL of amniotic fluid surrounds the fetus at 40 weeks of gestation. The amniotic fluid constantly moves as the fetus swallows "inhales" the fluid and then discharges it.

Amniotic Fluid is primarily produced by fetal urine in the latter half of the pregnancy; therefore the absence or reduction of the fetal urine production or blockage in the urinary tract can result in oligohydramnios. However, rupture of the membranes is the most common cause of oligohydramnios.

Oligohydramnios is where there is too little fluid surrounding the fetus in the uterus. This may take place because the fetus is not thriving appropriately. Decline in the amniotic fluid influences 1-5% of term pregnancies.

The majority physicians revealed that isolated oligohydramnios, or little amniotic fluid in an otherwise healthy pregnancy at term, was a risk factor for bad outcomes. Oligohydramnios happen in 3rd trimester of pregnancy usually predict an increasing risk to the pregnancy. Assessment of amniotic fluid pockets with ultrasound is a competent and reasonably reliable method of evaluating amniotic fluid volume and categorizing relative risk of perinatal morbidity. In pregnancies beyond 34 weeks, making use of amniotic fluid index to diagnose oligohydramnios can be expected to reliably identify fetuses at risk for compromised perinatal result.

Oligohydramnios, may place the fetus at major risk. In such cases, delivery is the optimal intervention. Oligohydramnios influences the pregnancy result and the wellbeing of the fetus. Oligohydramnios, in the absence of pre-mature rupture of membranes and fetal anomalies,

is considered as a symptom of chronic reduction in placental function, which results in reduction of fetal urinary output. It may be related to uteroplacental insufficiency, viral diseases, cause the fetus to be not capable to turn into the head down position for the birth, or compression of the fetus's umbilical cord unidentified fetal growth restriction (FGR), premature rupture of the fetal membranes and/ or postmaturity syndrome and malpresentations.

Diminishing amniotic fluid volume has been associated with increased risk of severe birth asphyxia, intrauterine growth retardation, meconium aspiration syndrome, low APGAR scores and congenital anomalies. Some cases of amniotic fluid decline are accompanied by urinary tract obstruction or renal agenesis, fetus growth disorders, chronic leaks from gaps in the fetal membrane and in 15-25% of cases fetal anomalies.

Fetal urinary tract anomalies, such as renal agenesis, polycystic kidneys, or any urinary obstructive lesion (eg, posterior urethral valves). Maternal problems, including placental vascular insufficiency, premature rupture of membranes or chronic leakage of amniotic fluid. The major maternal complication from this is chorioamnionitis. The incidence of this varies in the literature and has been reported anywhere from 21-74%. The earlier this occurs in pregnancy causes increased risk to the fetus. Thus, increasing the risk of neurologic complications, pulmonary hypoplasia and in severe cases, respiratory failure. Maternal use of prostaglandin synthase inhibitors or angiotensin- converting enzyme (ACE) inhibitors. Postmaturity syndrome in infants when a pregnancy extend beyond 42- weeks.

The maternal position influences uterine and umbilical blood flow. The enlarging uterus compresses the inferior vena cava and the lower aorta and decreases cardiac output, resulting in a decrease in uterine and placental perfusion, particularly when the mother is in the supine position. at 36–38 weeks of gestation the maternal left lateral position,

when compared with any other position, has the least disturbing effect on fetal hemodynamics. An increase in uterine and placental blood flow is likely the explanation for the increase in the amniotic fluid index and fetals urine production rate observed in study.

AIMS & OBJECTIVES

Aim: Determination of effect of oligohydramnios on maternal and fetal outcomes.

OBJECTIVES:

To study effect of oligohydramnios on maternal outcomes namely:

- 1) Incidence of spontaneous labour & Induction of labour.
- 2) Incidence of vaginal delivery, instrumental delivery & Lscs

To study effect of oligohydramnios on fetal outcomes namely:

- 1) Birth weight <2.5 kg and ≥ 2.5 kg
- 2) foetal distress
- 3) NICU admission

MATERIALS & METHODS

The Present Prospective comparative observational study was conducted at Department of Obstetrics & Gynaecology, Anugrah Narayan Magadh Medical College and Hospital (ANMMCH) Gaya, Bihar from August 2019 to July 2020.

All Pregnant women with gestational age 37 weeks or more coming for delivery to ANMMCH, Gaya, Bihar.

A sample of size 84 cases (minimum in each study group, i.e. total 168 cases with Group 1 (Oligohydramnios) to Group 2 (Controls) ratio being 1:1) satisfying the inclusion criteria would produce 80.0% statistical power (type II error = 0.20) and 5% type I error probability (0.05) to be able to detect the desired clinical significant difference (20% and higher incidence) in outcome measures (such as incidence of IUGR, NICU, Fetal distress etc) between two study groups with a two-tailed alternative hypothesis.

INCLUSION CRITERIA:

- 1) Patient with AFI (amniotic fluid index) <5 cm taken as study group and AFI (amniotic fluid index) 5-18 cm taken as control.
- 2) Gestational age of 37 or above
- 3) Singleton pregnancies with cephalic presentation

EXCLUSION CRITERIA:

- 1) Patient with premature rupture of membranes
- 2) Polyhydramnios (AFI >25 cm)

Maternal outcome/obstetric outcome

- 1) Incidence of Spontaneous labour
- 2) Incidence of Induction of labour
- 3) Incidence of Normal delivery/ Assisted Delivery/ L.S.C.S.

Foetal outcome

- 1) Apgar score
- 2) Birth weight
- 3) NICU admission
- 4) Neonatal death

METHODS:

Antenatal women with gestational age 37 weeks and above and fulfilling inclusion criteria attending our Out Patient Department or Labour rooms were included in the present study. Detailed antenatal history including presence of high risk factors was elicited from the patient, then they were clinically examined and subjected to ultrasonography. (In 1987 Phelan et al. described AFI as a method of semi-quantitatively estimating amniotic fluid volume 5. Phelan et al. defined oligohydramnios as an AFI < 5cm were allotted into the study group and another 50 women with AFI 8-18 cm were included into the control group. Labour was either spontaneous or induced in both study and control group.) labour will be monitored as per standard labour room protocols to detect any signs of fetal distress. Mode of delivery and intrapartum complications will be noted. At birth neonate will be assessed using 5minute APGAR score, birth weight and need of NICU admission.

STATISTICAL METHODS

Descriptive statistical analysis will be carried out to explore the distributions of several variable of the cases studied. Results on

categorical data will be shown as n (% of cases) and the results on quantitative variables will be shown as Mean $\pm$ Standard deviation across two study groups. The statistical significance of difference of various qualitative responses will be tested using Chi-square test for independence of attributes or Fisher's exact probability test. For comparing quantitative variables across two study groups, independent sample „t“ test will be used after confirming the underlying normality assumption. P-values less than 0.05 would be considered to be statistically significant. The entire statistical analysis will be performed using Statistical Package for Social Sciences (SPSS version 11.5, Chicago, IL) for MS Windows.

OBSERVATIONS AND RESULTS

- Total 168 patients (84 study group, 84 control group) satisfying inclusion and exclusion criteria were enrolled in our study.
- All 168 pregnancies resulted in live births.

Table 1 : Age wise distribution of women participated in the study

Group	No. of patients	Maternal age (years)		P-value
		Mean	$\pm$ SD	
Group A (Study)	84	27.10	3.16	0.435
Group B (Control)	84	27.46	2.94	

- By using 2 independent sample t-test p-value > 0.05 therefore there is no significant difference between mean maternal age (years) in group A and group B.

Table 2 : Gravida wise distribution of women participated in the study

Gravida	Group		Total	P-value
	Group A (Study)	Group B (Control)		
Primigravida	54	53	107	0.999
Multigravida	30	31	61	
Total	84	84	168	

p-value > 0.05 (not significant) chi-square test used.

- Out of 168 women enrolled in the study, 107 were primigravida and 61 were multigravida. Group A included 54 primigravida and 30 multigravida and Group B included 53 primigravida and 31 multigravida. The difference in the selection of women in the both the group was statistically insignificant with p value of 0.999.

Table 3 : Mode of delivery wise distribution of women participated in the study

	Vaginal delivery	Caesarean section (LSCS)	Total	P value
Group A (Study), n=84	44	40	84	0.044
Group B (Control), n=84	58	26	84	

p-value < 0.05 (significant) chi square test used.

- Out of 84 women of study group, 44 (52.38%) delivered vaginally and 40 (47.61%) women delivered by caesarean section. while Out of 84 women of control group, 58 (69.04%) delivered vaginally and 26 (30.95%) women delivered by caesarean section. The difference in mode of delivery in the both the group was statistically significant with p value of 0.044.

Table 4 : Initiation of labour (Spont./IOL/elective LSCS) wise distribution of women participated in the study

Initiation of labour	Group		Total	P-value
	Group A (Study)	Group B (Control)		
Spontaneous	31	71	102	<0.001
IOL	44	13	57	
Elective LSCS	9	0	9	
Total	84	84	138	

p-value < 0.05 (significant) chi square test used.

- Out of 84 women of study group, 31 women underwent spontaneous labour, 44 women induced for oligohydramnios and 9 women underwent elective caesarean section for severe oligohydramnios while Out of 84 women of control group, 71 women underwent spontaneous labour, 13 women induced and no women underwent elective caesarean. The difference in initiation of labour of both the group was statistically significant with p value of < 0.001.

Table 5 : NICU admission in the two groups

NICU admission	Group		Total	P-value
	Group A (Study)	Group B (Control)		
Yes	16	6	22	0.039
No	68	78	146	
Total	84	84	168	

p-value <0.05 (significant) chi square test used.

- Out of 84 babies of study group, 16 babies required NICU admission while Out of 84 babies of control group, 6 babies required NICU admission. The difference in number of NICU admission of both the group was statistically significant with p value of 0.039.

Table 6 : Birth weight of babies born in both the groups

Birth weight	Group		Total	P-value
	Group A (Study)	Group B (Control)		
<2.5 kg	20	7	27	0.011
≥2.5 kg	64	77	141	
Total	84	84	168	

p-value <0.05 (significant) chi square test used.

- Out of 84 babies of study group, 20 babies have <2.5 kg birth weight while Out of 84 babies of control group, 7 babies have <2.5 kg birth weight. The difference in number of babies having low birth weight was statistically significant with p value of 0.011.

Table 7 : APGAR score at 1 min. and 5 min. in babies born in both the group

APGAR score	Group		Total	P-value
	Group A (Study)	Group B (Control)		
<7	13	5	18	0.080
≥7	71	79	150	
Total	84	84	168	

p-value >0.05 (insignificant) chi square test used.

- Out of 84 babies of study group, 13 babies have APGAR score <7 at 1 min and 5 min after birth while Out of 84 babies of control group, 5 babies have APGAR score <7 at 1 min and 5 min after birth. The difference in APGAR score at 1 min and 5 min in both the group was statistically not significant with p value of 0.080.

DISCUSSION

The primary objective of the antenatal screening is to detect any conditions which can lead to a high risk pregnancy. Ultrasound examination during that period is a sensitive and reliable method of assessing the amniotic fluid and to detect oligohydramnios or polyhydramnios. Assessment of AFV during the antenatal period is considered a helpful tool in determining who is at risk for potentially adverse perinatal outcome. Thus This study was carried out to assess the impact of oligohydramnios on maternal and fetal outcome.

In our case-control study Out of 168 patients 84 (study group) and 84 (control group) recruited, maximum patients (85%) were in 20-30 years age group. In Casey et al, the mean maternal age was 23.9 years which is comparable to the present study.

In the present study, the highest percentage of women in the study group and control groups (64% & 63 % respectively) were primigravida, This is agreement with that of Ghike et al., who observed that the majority of the women in both the groups were either nulliparous or Para one. Conversely, Jagatia et al., reported that the incidence of oligohydramnios was more in primipara (52.0%) which is compatible with the study of Jandial et al., and Petrozella et al., who showed that the incidence of oligohydramnios was 60.0% in primigravida.

The present result also revealed that, the women in the study group were more likely to have a shorter mean weeks of gestation compared to the control group (mean 38.91 vs. 39.23 respectively). In agreement with this Gumus et al., reported that gestational age at delivery was 37.7 weeks for study group and 38.3 weeks for control group (p=0.004). In addition, Ghike et al., reported that the mean age of gestation in women with severe oligohydramnios was 40.30 ± 1.6 weeks and in women with borderline oligohydramnios was 40.08 ±

1.61 weeks. A possible explanation of the above findings might be related to the fact that oligohydramnios is mostly associated with fetal distress which requires an early interference through induction of labor. Concerning the current study finding of the significantly higher proportion of abnormal fetal heart rate (fetal deceleration) in the oligohydramnios group asserted that the most strongly associated characteristics with oligohydramnios was the higher percentage of women with abnormal fetal heart rate. Also in agreement with the present study finding Voxman et al., and Jandial et al., observed that, women with oligohydramnios were significantly (p<0.005) more likely to have abnormal fetal heart rate tracings. In addition, Desai et al., found an increase in late decelerations in women with low AFI which was statistically of just borderline significance. This is in agreement with the current study finding which revealed that 36% of women who complained from oligohydramnios underwent emergency cesarean section for foetal distress. The FHR pattern changes and decelerations can be explained by the poor placental functions associated with oligohydramnios. This results in deficient fetal oxygenation and fetal asphyxia which results in abnormal FHR changes.

The incidence of oligohydramnios was 54% in primigravida in our study. Garmel et al. supported that 67 % of women with Oligohydramnios were primigravida and Charu et al supported that 66 % of women were primigravida. In Donald D et al, the incidence of oligohydramnios was 60% in primigravida which is comparable to our study.

According to the present study findings, the rate of spontaneous delivery was higher in the control group (84%), compared to the study group (37%). Conversely, the rate of caesarean section (C.S.) was higher in oligohydramnios group (47.67%). This is in coherence with Hanafy who reported that there is statistically significant increase in the rate of C.S in oligohydramnios group compared with those in the control group (40.0% vs. 20.0% respectively). He also, reported a higher rate of vaginal delivery among the control group than that in the study group (80.0% vs. 60.0%). In addition, Kahkhaie et al., observed that C.S. was done in 20.2 % in oligohydramnios group and 8.6% in control group. Also, Ahmad and Munim noticed a more than two fold higher C.S. rate in the isolated oligohydramnios group (42.0%) compared to 18% in the control group. Moreover, Voxman et al., study in low AFI as a predictor of adverse perinatal outcome found an increased rate of C.S. in oligohydramnios group (14.7%) because of fetal distress. Such discrepancies could be explained by the fact that deficient quality resources of antepartum and intrapartum fetal monitoring in the present study setting might influence the rate of detection of all the parameters of fetal heart rate tracing. Thus C.S. was mostly the best option to overcome the adverse effect on the perinatal outcome.

Concerning fetal outcomes, the present study showed significantly better Apgar score at the first and fifth minutes among babies with normal amniotic fluid index than those with oligohydramnios, although it was not significant statistically. This is similar to Chate et al., who noticed that the Apgar score of the study group was less than 7 in 30% at 1st minute, and 16% at 5th minute. In disagreement with the above finding Umber et al., showed that, Apgar score of <7 in the oligohydramnios group was 8.0% at 1st minute, and 6.0% at 5th minute. Furthermore, Golan et al., reported a low Apgar score at fifth minutes in 4.6% of neonates. While, Ahmad and Munim noticed that the Apgar scores at one and five minutes after birth did not show a significant difference between the two groups (P= 0.575). In this respect, Sarno et al., noted a significantly higher rate of fetal distress and low Apgar score in women with oligohydramnios. This is reported to be due to head and cord compression. Dissimilarities between the above mentioned results could be attributed to the available better intrapartum fetal assessment facilities in developed countries. They concluded that liberal use of amnioinfusion in women diagnosed with oligohydramnios might have resulted in improved outcomes which were not seen in previous oligohydramnios at the third trimester and perinatal outcome studies. But amnioinfusion is yet not established in the research setting.

The current study has also demonstrated that, the mean birth weight of the study group was 2.68 kg while of control group was 2.85 kg. This finding were similar with the prospective case control study conducted by Chate et al., who noticed that the mean birth weight was less in oligohydramnios group.

The current study has also demonstrated no evidence of congenital anomalies in the study group and the control group). However, the incidence reported by Guin et al., and Chate et al., was much higher than the present study (8.5 % & 6.0 % respectively), this is most probably due to the sample size and its characteristics.

The current study findings revealed that Statistical significant difference was noted between the two groups as regards admission to neonatal intensive care unit (NICU). As 19 % of neonates in the oligohydramnios group had been admitted to NICU compared to 7 % in the control group. This is consistent with the studies of Johnson et al., and Jagatia et al., who found that 20.0% of neonates had NICU admission in oligohydramnios group. It also agrees with Garmel et al., and Jandial et al., who noticed that the rate of NICU admission was found to be 16.0% and 18.5% respectively. Conversely, Hanafy, reported that the admission to NICU was not significantly increased in the oligohydramnios group ($P=0.62$).

Oligohydramnios is frequent occurrence and demands intensive fetal surveillance and proper antepartum and intrapartum care. Amniotic fluid volume is a predictor of fetal tolerance in labour and its decrease is associated with increased risk of abnormal heart rate and meconium stained fluid.

Due to intrapartum complication and high rate of perinatal morbidity and mortality, rates of caesarean section are rising, but decision between vaginal delivery and caesarean section should be well balanced so that unnecessary maternal morbidity can be prevented and on other side timely intervention can reduce perinatal morbidity and mortality.

CONCLUSION

An amniotic fluid index of ≤ 5 cm detected after 37 completed weeks of gestation is an indicator of poor perinatal outcome. Oligohydramnios was found to be a high- risk factor for pregnancy in term of increased incidence of adverse pregnancy outcome like more operative interference and foetal outcome as NICU admission, low birth weight.

The incidence of adverse pregnancy outcomes as follows:

- The rate of Cesaerean section was 47.67%.
- 24% of the newborn found low birth weight(<2.5 kg) .
- The incidence of neonatal resuscitation and NICU admission was 19%.
- No newborn had congenital anomalies.

There is a significant association between the severity of oligohydramnios and fetal outcome in term of neonatal resuscitation and NICU admission.

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