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A STUDY OF OBSTETRIC AND PERINATAL OUTCOME IN PREGNANCIES WITH OLIGOHYDRAMNIOS: A PROSPECTIVE OBSERVATIONAL STUDY

Obstetrics & Gynaecology

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ABSTRACT

Introduction : Oligohydramnios, defined as when the Amniotic fluid index is less than 5. Definition of increased or decreased amniotic fluid volume or based on sonographic criteria. Oligohydramnios complicates 1-2 % of pregnancies. Amniotic fluid provides the cushion effect against the constricting confines of the gravid uterus. It creates space and help in musculoskeletal development of fetus, helps in normal fetal lung development and prevents compression of umbilical cord, placenta and hence protects the fetus from vascular and nutritional compromises. Oligohydramnios is associated with high-risk adverse perinatal outcome like fetal distress, meconium aspiration, low APGAR, joint contracture, pulmonary hypoplasia etc., and associated with maternal morbidity in the form of increased rates of induction and/or operative interference. **Materials & Methods :** This is the prospective observational study of parturient with oligohydramnios admitted in the department of OBG, BMCRC Ballari, study conducted for a period of 6 months August 2023 to January 2024 consist of 70 subjects. This study is conducted on all singleton, non-anomalous, low risk pregnant women with AFI less than or equal to 5 with intact membranes and gestational age between 37-42 weeks. After obtaining approval and clearance from the institutional ethical committee, the pregnant woman meeting the inclusion and exclusion criteria was enrolled in the study after obtaining informed consent. Detailed clinical history including obstetric, menstrual, past and personal history was taken and detailed examination was done. Basic routine blood investigations were done. Liquor volume was estimated by ultrasonography by measuring the AFI by four quadrant technique of Phelan or when the single deepest vertical pocket measures less than 2cms. Delivery was optimized depending on antepartum fetal surveillance. **Results:** The mean age of mothers at time of delivery was lower (25.84 yrs) in the oligohydramnios group. Most of the patients were primiparous, this difference was found to be non-significant. Out of 70 cases, majority of cases were between 39-39.6 weeks of gestation 31 cases (44.28%). Comparison of pregnancy outcome between the two groups is represented in Table 2. Low birth weight, NICU admission, fetal distress, fetal death, APGAR score, preterm delivery, and neonatal death. However, meconium staining, mode of delivery and postpartum hemorrhage were almost equal in the two groups (p>.05). The average and standard deviation of AFI were in 6.14±1.08 cm in oligohydramnios group. APGAR score was above 7 in 80% patients in oligohydramnios group. The table and graph show the distribution of cases based on admission NST. It was reactive in 37 cases (52.85%) at the time of admission. Augmentation was done for 23 cases (32.8%). **Conclusion** : Our present study shows that even though there is an increased rate of caesarean section, NICU admission and observation, meconium stained liquor and NST changes there is no significant increase in the perinatal morbidity and mortality.

KEYWORDS

Pregnancies, Oligohydramnios, Obstetric Outcome, Perinatal Outcome

INTRODUCTION

Oligohydramnios, defined as when the Amniotic fluid index is less than 5. Definition of increased or decreased amniotic fluid volume or based on sonographic criteria. Oligohydramnios complicates 1-2 % of pregnancies. [] Amniotic fluid provides the cushion effect against the constricting confines of the gravid uterus. It creates space and help in musculoskeletal development of fetus, helps in normal fetal lung development and prevents compression of umbilical cord, placenta and hence protects the fetus from vascular and nutritional compromises. [] Oligohydramnios is associated with high-risk adverse perinatal outcome like fetal distress, meconium aspiration, low APGAR, joint contracture, pulmonary hypoplasia etc., and associated with maternal morbidity in the form of increased rates of induction and/or operative interference. [] The umbilical cord compression during labor is common with oligohydramnios which increases the risk for caesarean delivery for fetal distress and 5 minutes Apgar score less than 7. [] The decrease of amniotic fluid volume is associated with the increased labor induction, still birth, non-reassuring fetal heart pattern, meconium aspiration syndrome and neonatal death.[-16]

MATERIALS & METHODS

This is the prospective observational study of parturient with oligohydramnios admitted in the department of OBG, BMCRC Ballari, study conducted for a period of 6 months from August 2023 to January 2024 consist of 70 subjects.

Inclusion criteria

1. Singleton pregnancy with gestational age 37-42 weeks.
2. Patients willing to give informed consent and participate in the study
3. With intact membranes.
4. AFI less than or equal to 5 measured by Phelan's four quadrant technique or when the single deepest vertical pocket measures less than 2cms

Exclusion criteria

1. Fetal malformations
2. Patients with major medical disorders like respiratory and cardiac diseases
3. Hypertensive disorders of pregnancy
4. GDM

Method of collection of data (Including sampling procedure, if any)

This is the prospective observational study of parturient with oligohydramnios admitted in the department of OBG. This study is conducted on all singleton, non-anomalous, low risk pregnant women with AFI less than or equal to 5 with intact membranes and gestational age between 37-42 weeks at BMCRC Hospital in the Department of Obstetrics and Gynecology after taking informed consent. After obtaining approval and clearance from the institutional ethical committee, the pregnant woman meeting the inclusion and exclusion criteria was enrolled in the study after obtaining informed consent. Data was collected using a proforma by consecutive sampling method. Detailed clinical history including obstetric, menstrual, past and personal history was taken and detailed examination was done. Basic routine blood investigations were done.

Liquor volume was estimated by ultrasonography by measuring the AFI by four quadrant technique of Phelan or when the single deepest vertical pocket measures less than 2cms. Delivery was optimized depending on antepartum fetal surveillance.

Sample Size:
Sample size was estimated by using the proportion of Maternal Outcome [% of LSCS among subjects with Oligohydramnios] at22% from the study by K Sangeetha et al.[6] using the formula.

$$\text{Sample size} = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2}$$

Here

$Z_{1-\alpha/2}$ = Is standard normal variate (at 5% type 1 error ($P<0.05$) it is 1.96 and at 1% type 1 error ($P<0.01$) it is 2.58). As in majority of studies P values are considered significant below 0.05 hence 1.96 is used in formula.
p = Expected proportion in population based on previous studies or pilot studies.
d = Absolute error or precision – Has to be decided by researcher.

P=22
q=78
d=10%

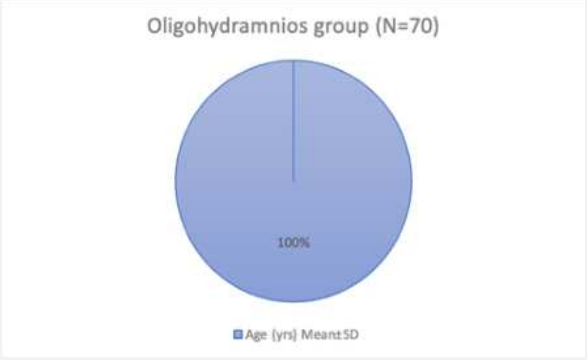
Using the above values at 95% Confidence level a sample size of **70 subjects** with Oligohydramnios was included in the study.

Statistical Analysis Plan
The collected data were entered in the Microsoft Excel 2016 and was analysed with IBM SPSS Statistics for Windows, Version 29.0.(Armonk, NY: IBM Corp). To describe about the data descriptive statistics frequency analysis, percentage analysis was used for categorical variables and for continuous variables the mean and S.D was used. To find the association of significance in categorical data the Chi-Square test or Fisher's exact test was used. Any other necessary test found appropriate was dealt at the time of analysis, based on the data distribution. In all the above statistical tools the probability value 0.05 was considered as significant level.

RESULTS
The mean age of mothers at time of delivery was lower (25.84 yrs) in the oligohydramnios group. Most of the patients were primiparous, this difference was found to be non-significant (table 1).

Table 1: Demographic profile of oligohydramnios in singleton pregnancy

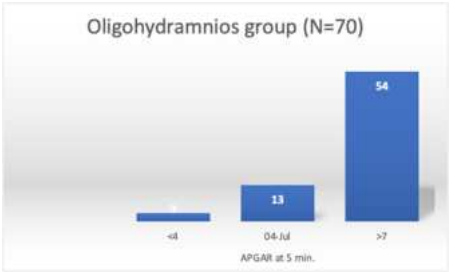
Demographic profile	Oligohydramnios group (N=70)
Age (yrs) Mean±SD	25.84±5.51
Gravid (Primi/Multi)	2.92



Graph 1: Demographic profile of oligohydramnios in singleton pregnancy

Table 2: Comparison of outcome of pregnancy of Oligohydramnios group

Demographic profile		Oligohydramnios group (N=70)
APGAR (Mean±SD)		9.68±1.39
APGAR at 5 min.	<4	3 (4.28%)
	4-7	13 (18.57%)
	>7	54 (77.14%)
Birth weight (Mean±SD) (Kg)		4.34±0.539

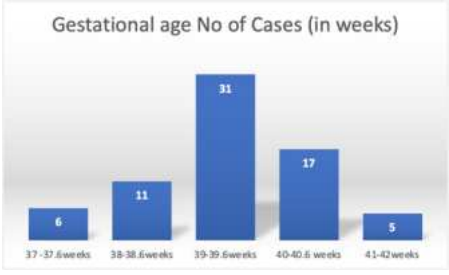


Graph 2: Comparison of outcome of pregnancy of Oligohydramnios group

Table 3: Distribution of study subjects based on gestational age.

Gestational age (in weeks)	No of Cases	Percent
37 -37.6weeks	6	8.57
38-38.6weeks	11	15.71
39-39.6weeks	31	44.28
40-40.6 weeks	17	24.28
41-42weeks	5	7.14
Total	**70**	**100.0**

The above table and graph show the period of gestation in weeks. Out of 70 cases, majority of cases were between 39-39.6 weeks of gestation 31 cases (44.28%).

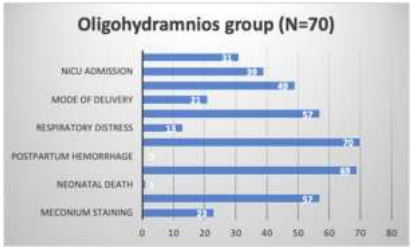


Graph 3: Distribution of study subjects based on gestational age.

Table 4: Distribution of various parameters of Oligohydramnios group

Demographic profile		Oligohydramnios group (N=70)
Meconium staining	Yes	23
	No	57
Neonatal death	Yes	1
	No	69
Postpartum hemorrhage	Yes	0
	No	70
Respiratory distress	Yes	13 (18.5%)
	No	57 (81.4%)
Mode of delivery	Vaginal	21 (30%)
	LSCS	49 (70%)
NICU admission	Yes	39 (55.7%)
	No	31 (44.3%)
AFI		6.14±1.08

Comparison of pregnancy outcome between the two groups is represented in Table 2. Low birth weight, NICU admission, fetal distress, fetal death, APGAR score, preterm delivery, and neonatal death. However, meconium staining, mode of delivery and postpartum hemorrhage were almost equal in the two groups (p>.05). The average and standard deviation of AFI were in 6.14±1.08 cm in oligohydramnios group. APGAR score was above 7 in 80% patients in oligohydramnios group. (Table 4).



Graph 4: Distribution of various parameters of Oligohydramnios group

Table 5: Distribution of study subjects based on admission NST

Admission NST	No of Cases	Percent
Reactive	37	52.85
Non-reactive	33	47.14
Total	**70**	**100.0**

The above table and graph show the distribution of cases based on admission NST. It was reactive in 37 cases (52.85%) at the time of admission.

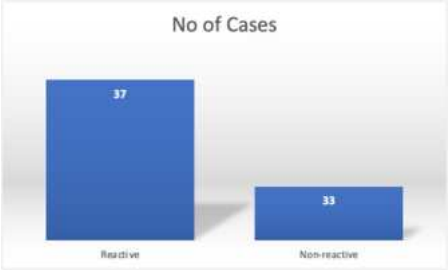
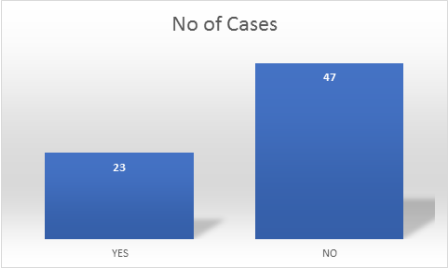


Table 5: Distribution of study subjects based on admission NST

Table 6: Distribution of study subjects based on oxytocin augmentation.

Oxytocin augmentation	No of Cases	Percent
YES	23	32.8
NO	47	67.1
Total	**70**	**100.0**

The above table and graph shows the distribution of cases based on oxytocin augmentation. Augmentation was done for 23 cases (32.8%).



Graph 6: Distribution of study subjects based on oxytocin augmentation.

DISCUSSION

Oligohydramnios with AFI ≤5cm can lead to an increase in perinatal mortality and morbidity. Under these conditions, there is increased frequency of meconium-stained liquor, fetal distress, low apgar scores, abnormal fetal heart rates. During the last trimester, the fetus urinates around 30% of its body weight and swallows around 20 to 25% of amniotic fluid each day. The lung also secretes about 10% to amniotic fluid. Any minor inconsistency through the production and swallowing process may lead to polyhydramnios.[17]

Shiferaw MA (2024).[18] conducted a study on pregnancy outcome after diagnosis of oligohydramnios and found that there was an increase in induction of labour (42% over 18%), nonreassuring fetal heart rate patterns (48% vs 39%), NICU admission (7% over 2%), MSAF (1% over 0.1%), neonatal death rate (5% over 0.3%) associated with oligohydramnios.

Bumrah S et al (2023). [19] conducted a study on measurement of AFI and fetal outcome and found AFI more than 5cm had better chance of predicting a good fetal outcome.

Twesigomwe G et al (2022). [20] assessed fetal outcome in 145 babies with oligohydramnios and found increased incidence of fetal distress, MSAF (29%), IUGR (24.5%), breech (17%), birth asphyxia (11.5%). Rita D (2021). [21] found increased risk of caesarean delivery with antepartum and intrapartum AFI ≤5cm, due to fetal distress and such babies had low apgar score at 5 mins.

Oligohydramnios is commonly encountered, and it necessitates extensive fetal surveillance and perfect antepartum and intrapartum care. Amniotic fluid volume is an important predictor of fetal level of tolerance during labour and its decrease is associated with increased risk of fetal distress and meconium staining of fluid. Due to unforeseen intrapartum complication and high incidence of perinatal mortality and morbidity, caesarean section rates are on the rise, but the decision between caesarean section and vaginal delivery must be well balanced so that unnecessary maternal morbidity could be prevented, and timely decision can reduce perinatal mortality and morbidity. But often oligohydramnios is used as an indication for operative delivery. Hence assessing amniotic fluid volume antenatal is essential in determining high and low risk groups.

The rate of NICU admission was found to be 52%, of which perinatal mortality was 4%. In the study done by NankaliA et al.[22] 17% of new-born were referred to nearby paediatric hospital immediately following delivery. This difference may be due to the facilities encountered in the hospital set up. The probable explanations adduced for this include that eating and urinating processes, rather than fetal size, are more engaged in the control of amniotic fluid content.

CONCLUSION

Pregnancies with isolated oligohydramnios (AFI ≤ 5) at or beyond 37 weeks are associated with increased rate of non reactive NST, FHR deceleration during labor, development of fetal distress, rate of caesarean delivery and low birth weight. Rate of cesarean section for fetal distress is increased because of increased rate of induction of labor in the women with oligohydramnios. Routine induction of labor for isolated oligohydramnios is not recommended. No appropriate route of delivery can be recommended by the study. It is preferable to allow patients to go into spontaneous labor with continuous fetal heart rate monitoring. Termination of pregnancy with oligohydramnios by caesarean delivery or instrumental vaginal delivery should be done at the onset of fetal distress. Antepartum diagnosis of oligohydramnios warrants close fetal surveillance.

Our present study shows that even though there is an increased rate of caesarean section, NICU admission and observation, meconium stained liquor and NST changes there is no significant increase in the perinatal morbidity and mortality.

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