



PREGNANCY OUTCOME IN ISOLATED OLIGOHYDRAMNIOS AT TERM

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ABSTRACT

Introduction: The objective of this study was to compare the pregnancy outcome in cases with isolated oligohydramnios with low risk women having normal amniotic fluid volume.

Methods: This prospective case control study included 80 women with isolated oligohydramnios (AFI < 5 but no maternal or fetal high risk factor) and these were compared with 320 low risk women with term pregnancy without oligohydramnios. Maternal and perinatal outcomes in pregnancies with oligohydramnios were compared with perinatal outcomes pregnancies with an amniotic fluid index > 5cm.

Observations: The subjects with isolated oligohydramnios were associated with an increased incidence of Doppler abnormalities, CTG changes, meconium stained amniotic fluid and cesarean delivery as compared to women with normal amount of amniotic fluid. There was no difference between the cases and controls as regards duration of labor, need for oxytocin augmentation, need for neonatal resuscitation, APGAR score at 5 minutes, NICU admission, birth weight of neonates or incidence of LSCS for fetal distress.

Conclusions: Apart from the increased cesarean section rate, which was partly attributable to the obstetrician's practice choices, there were no differences in the maternal or perinatal outcomes.

Key words: Pregnancy, Oligohydramnios, fetal compromise, perinatal morbidity, mortality

INTRODUCTION

Quantitative estimation of amniotic fluid volume is a part of routine obstetric scan. Semi quantitatively the amount of amniotic fluid is described using the amniotic fluid index, which is calculated by adding the depth in centimeters of the largest vertical pocket in each four quadrants.¹ Oligohydramnios occurs in about 1% to 5% of pregnancies at term^{2,3}. The use of amniotic fluid index (AFI) less than or equal to 5 cm to define

oligohydramnios was suggested first by Phelan et al in 1987 as an arbitrary cutoff value.³

It is well established that oligohydramnios is associated with a high risk of adverse perinatal outcome^{4,5}. On the other hand oligohydramnios is a poor predictor for adverse outcomes.^{6,7} An explanation for these seemingly conflicting observation lies in the fact that not all oligohydramnios are the same. Oligohydramnios with unfavorable maternal and/or fetal conditions

(such as IUGR, anomalies or hypertension) leads to much worse perinatal outcome than a normal amniotic fluid volume with the same conditions. In these conditions oligohydramnios may be an indicator of a more severe impaired placental function, fetal compromise and worse maternal / fetal conditions. Isolated oligohydramnios in low risk women may be a different situation. If there is evidence to prove that the pregnancy outcome in these pregnancies is not compromised, it could save a lot of interventions like induction of labor and cesarean section, which is definitely in the better interest of the patient.

The objective of this study was to compare the pregnancy outcome in cases with isolated oligohydramnios with low risk women having normal amniotic fluid volume. The pregnancy outcomes studied were doppler abnormalities, CTG changes, meconium stained amniotic fluid, duration of labor, need for oxytocin augmentation, need for neonatal resuscitation, APGAR score at 5 minutes, NICU admission, birth weight of neonates, and cesarean section rate.

METHODS

This prospective case control study on "Pregnancy outcome in isolated oligohydramnios at term" was carried out in Department of Obstetrics and Gynecology at Medical college and SSG Hospital, Vadodara from 15 December 2012 to 14 December 2013 after obtaining approval from the ethics committee of the college.

This study included 400 (booked or unbooked) attending antenatal clinic or labor room of the department.

The women enrolled in the study were divided in 2 groups. Cases included women having AFI<5 and controls had women with AFI>5. The control group was similar in regard to antepartum variables i.e. maternal age, parity, and gestational age and had no antenatal complication.

The study included 80 women with isolated oligohydramnios (AFI < 5 but no maternal or fetal high risk factor) and these were compared with 320 low risk women with term pregnancy without oligohydramnios. The inclusion and exclusion criteria are given as below. The sample size was calculated by taking study subjects: control subjects =1:4 at power 80 and 95% confidence intervals.

Inclusion criteria for cases:

Cases with Singleton pregnancy with well established dates; > 37 weeks to < 40 weeks period of gestation; AFI < 5; Cephalic presentation; and intact membranes were included in case group.

Inclusion criteria for controls:

Singleton pregnancy with well established dates; > 37 weeks to < 40 weeks of gestation; AFI >5; Cephalic presentation; and Intact membranes were included in control group.

Exclusion criteria for cases and controls:

Cases with < 37 weeks and > 40 weeks period of gestation; Gestational diabetes mellitus; Multi fetal gestation; Congenital anomalies of the fetus; Premature rupture of membrane; Intra-uterine growth restriction; or Intrauterine death of fetus were excluded from the study.

Women identified having isolated oligohydramnios on clinical examination were subjected to ultrasound examination to confirm oligohydramnios. These were included in the study if AFI was less than 5. Amniotic fluid measurement was performed by ultrasound on low risk women with term pregnancy fulfilling the inclusion criteria. Amongst them, the women having AFI more than 5 were included in the study as cases. Estimates of amniotic fluid volume was recorded by means of AFI described by Phelan et al.³ AFI values of < 5 cm was interpreted to represent oligohydramnios. Women detected to have oligohydramnios antenatally were followed up for pregnancy outcome.

Color Doppler examination was carried out in women with isolated oligohydramnios. Cardiotocography (CTG) was done as a routine in these cases. Patients with abnormal CTG and Doppler studies at the time of diagnosis or any time during fetal surveillance were considered for termination of pregnancy. No interventional drug was used during the course of the study.

Patient information sheet was given to all women enrolled in the study and an informed written consent for participation in the study was taken. The further management as regards expectant management (biweekly CTG and Doppler studies till delivery), induction of labor or cesarean section was at the discretion of the attending clinician. The data were collected as regards the social and environmental history, obstetric history, and maternal general and systemic examination. Details of neonate at birth were recorded. Maternal and neonatal follow-up was done up to discharge from the birth. Apart from the usual case details, selected outcome variables of these

pregnancies (for cases as well as controls) were recorded and analyzed.

The data was analyzed with the help of computer software SPSS version 12.0 for windows. Statistically significant differences were evaluated using F test. P value of <0.05 was considered as statistically significant. For discrete data, relative (RR) was calculated.

RESULT

The study included 80 cases and 320 controls that were enrolled during the study period of 1 year. Both the groups were comparable with regards to age and residential status.

Table no 1 shows distribution of study participants based on type of admission, parity and gestational age. The cases and controls were comparable as regards these parameters with the P value statistically not significant.

Color Doppler study of umbilical artery and CTG was done in the cases as well as controls. The subjects having abnormal color Doppler with isolated oligohydramnios AFI < 5 and non reactive CTG were all delivered by elective caesarean section.

At the time of presentation, 63 (78.75%) cases and 33 (10.31%) controls were not in labor. Labor was induced in 12 (15%) cases and 22 (6.88%) controls. The reasons for induction of labor in cases were reduced amniotic fluid. The controls underwent induction of labor for reasons other than reduced amniotic fluid. The remaining subjects were already in labor at the time of presentation.

In cases out of 80 patients, 65 (18.75%) were delivered by LSCS and 15 (18.25%) were delivered by vaginally while in control group 235 (73.44%) were delivered vaginally and 85 (26.56%) were delivered by LSCS. The difference was highly significant statistically. The relative risk for cesarean section was found to be 3.0588.

Amongst the cases, 12 patients were induced for labor and out of them 10 patients were delivered vaginally while 2 patients had to be delivered by LSCS due to fetal distress. While in control group 22 patients were induced out of whom 18 (81.82%) patients had delivered vaginally and 4 (18.81%) patients underwent for caesarean section for fetal distress. The difference was statistically not significant. Statistically, the difference was significant for meconium staining of amniotic fluid. The need for augmentation of oxytocin and the progression of labor was found to be similar in oligohydramnios as compared with those with normal amount of amniotic fluid.

Table 1: Distribution of study participants based on type of admission, parity and gestational age

	Cases (%)	Controls (%)	P value
Admission			
Booked	41 (51.25)	151 (47.19)	0.5338
Un booked	39(48.75)	169 (52.81)	0.5338
Parity			
Primi para	47 (58.75)	156 (48.75)	0.1334
Second para	21(26.25)	112 (35.00)	0.1466
Third para	12 (15.00)	52 (16.25)	0.8659
Gestational age			
37 - 38 week	14 (17.50)	42 (13.13)	0.3669
38 - 39 week	25 (31.25)	110 (34.38)	0.6919
39 - 40 week	41 (51.25)	168 (52.50)	0.9006

Table 2: Distribution of study participants based on Color Doppler study of Umbilical artery, CTG and status of labor at presentation

	Cases (%)	Controls (%)	P-value	Relative Risk
Abnormal Doppler	38 (47.50)	24 (7.50)	< 0.0001	6.33
Nonreactive CTG	52 (65)	123 (38.44)	< 0.0001	1.69
Spontaneous onset of labor	5 (6.25)	265 (82.81)	< 0.0001	0.0755
Induced labor	12 (15)	22 (6.88)	0.0204	2.1818

Table 3: Outcome of Labor in study participants

Outcome of labor	Cases (%)	Controls (%)	P value	Relative Risk
LSCS	65 (81.25)	85 (26.56)	< 0.0001	3.0588
LSCS in induced labor	2 (16.67)	4 (18.18)	0.9121	0.9161
Meconium stained amniotic fluid	41 (51.25)	112 (35.00)	0.0099	1.46
Requirement of oxytocin augmentation	17 (21.25)	110 (34.38)	0.2745	0.6182
Prolonged first stage	0	8 (2.79)	0.3152	0.2331
Prolonged second stage	0	26 (9.06)	0.0682	0.0748

Table 4: Neonatal outcome in study participants

	Cases (%)	Controls (%)	P Value	Relative risk
Birth weight < 2 kg	4 (5.0%)	7 (2.19%)	0.1783	2.2857
Resuscitation required	36 (45%)	139 (43.44%)	0.7994	1.0360
Immediate cry	65 (81.25%)	269 (81.06%)	0.5639	0.9665
5 minute APGAR ≤ 7	16 (20.0%)	54 (16.88%)	0.5064	1.1852
Admission in NICU	16 (20.0%)	60 (18.75%)	0.7979	1.0667

The above table suggests that there is no statistically significant difference between the two groups as regards birth weight < 2 kg, the need for neonatal resuscitation, 5 minute APGAR score ≤ 7 and admission in neonatal ICU.

DISCUSSION

At all weeks of gestation, the difference between case and control groups is not significant. It can be seen that the finding of isolated oligohydramnios increases with increasing the gestational age from 37 to 40 weeks. Obviously, this can be explained as reduction of amniotic fluid volume with advancing gestational age at term and it occurs physiologically even in pregnancies with normal amniotic fluid.

In this study, abnormal Doppler study and non-reactive CTG was significantly higher in women with isolated oligohydramnios. In a 2003⁸ study by Pasquini et al, 105 cases of oligohydramnios were compared with a control group (105 patients) matched for maternal age, gestation period and parity. The incidence of induction, fetal distress and variable deceleration was significantly higher in the group with AFI 5 or less. However, the rate of late decelerations was not different in this study. Another study published in 2007⁹ by Manzares et al, the overall rate of cesarean deliveries and cesarean deliveries for non-reassuring fetal status, and operative vaginal delivery rates and those for non-reassuring fetal status were higher in the oligohydramnios group than in the control group. However, there were no differences between groups in neonatal outcome or perinatal morbidity or mortality.

In this study, out of the 65 subjects who underwent cesarean sections, 52 had CTG abnormalities either antepartum or during labor. The possibility that oligohydramnios may be associated with umbilical cord compression and resultant fetal distress in presence of uterine contractions is usually the driving factor in opting for cesarean sections by obstetricians. There is significant divergence regarding the management of isolated oligohydramnios. Despite being unsure of its

benefit, most practitioners lean towards intervention. A metaanalysis published in 2013¹⁰ suggested that in term or post-term pregnancies, isolated oligohydramnios is associated with increased risk of obstetric interventions but outcomes are similar to those of pregnancies with normal amniotic fluid. The available literature is insufficient to make firm recommendations supporting intervention for isolated oligohydramnios. In a study conducted in 2004⁹ to evaluate the outcome of active induction of labor for isolated oligohydramnios in low-risk term gestation, the overall rate of cesarean deliveries and cesarean deliveries for non-reassuring fetal status, and operative vaginal delivery rates and those for non-reassuring fetal status were higher in the oligohydramnios group than in the control group. There were no differences between groups in neonatal outcome or perinatal morbidity or mortality.

In this study, there was no difference in the cesarean section rate after labor induction. In a case-control study by Conway in 1998¹¹, 183 low-risk, term parturients with oligohydramnios were matched to 183 women of similar gestational age and parity who presented in spontaneous labor. The patients with isolated oligohydramnios were induced and showed an increased cesarean delivery rate. It was not due to non-reassuring fetal surveillance and was attributed to the induction process. A study of Norwich published in 2007¹², induction of labor and cesarean section rate was high but there was no increased perinatal morbidity when compared with pregnancies managed expectantly. There have been other studies with similar results.^{13,14}

As seen in table 4, the incidence of low birth weight was not high in isolated oligohydramnios. However, some studies do suggest that isolated oligohydramnios is associated with low birth weight babies. In a study of 2014¹⁵ conducted in Karnataka, it was concluded that isolated oligohydramnios without any complicating factor is not associated with adverse perinatal outcome, though the babies may have a lower birth

weight. The high rate of caesarean section in that study was presumed to be because of fetal distress that could not be confirmed by fetal scalp blood sampling.

Generally it is accepted that oligohydramnios is associated with poor perinatal outcomes.¹⁶⁻¹⁸ In this study there was no difference in the need for neonatal resuscitation in cases with isolated oligohydramnios. The 5-minute APGAR score and NICU admission rate was also not different. This suggests that the neonates of cases with isolated oligohydramnios and those with normal amniotic fluid behave in a similar manner. Another retrospective cohort study published in 2014¹⁹, also suggested that isolated oligohydramnios at term by itself is not associated with increased obstetrical morbidity. Other authors have observed similar results.²⁰⁻²³

CONCLUSIONS

The results of this study indicated that women with isolated oligohydramnios were associated with an increased incidence of Doppler abnormalities, CTG changes, meconium stained amniotic fluid as compared to women with normal amount of amniotic fluid. There was an increased rate of cesarean sections in subjects with isolated oligohydramnios, which was partly attributable to the obstetrician's practice choices. There was no difference between the low risk women with isolated oligohydramnios and women with normal amount of amniotic fluid as regards duration of labor, need for oxytocin augmentation, need for neonatal resuscitation, APGAR score at 5 minutes, NICU admission and birth weight of neonates.

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