Pregnancy outcome in cases of oligohydramnios after 28 weeks of gestation

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ABSTRACT

Background: Amniotic fluid volume may reflect a problem with fluid production or circulation due to fetal, placental, and maternal pathology. Some authors have shown that amniotic fluid index (AFI) is a poor predictor of adverse pregnancy outcome, but others have not confirmed the association of adverse perinatal outcome with oligohydramnios. Objectives: To compare the mode of delivery and neonatal outcome in patients with oligohydramnios (AFI < 5 cm) with no-oligohydramnios group (AFI 5–25 cm). Methods: A prospective hospital-based observational study was carried out in the Department of Gynecology and Obstetrics, Nobel Medical College, Biratnagar; a referral center in eastern Nepal. In 1 year duration, 100 patients who completed 28 weeks of gestation with AFI < 5 cm were included in the oligohydramnios group and 100 patients having AFI 5–25 cm were enrolled to the no-oligohydramnios group. Results: A total of 8096 women were admitted during the study from March 1, 2015 to February 28, 2016. Among them, 100 patients meeting the inclusion criteria were taken into oligohydramnios group. AFI < 5 cm was more in primipara 58 (58%) and 43 (43%) were postdated pregnancy. Increased operative delivery [85 (85%)] was found in oligohydramnios group, whereas it was 30 (30%) in the no-oligohydramnios group. The neonatal outcome which was assessed by Apgar score (P < 0.003) and Neonatal Intensive Care Unit admission (P < 0.026) were significantly different between the two groups. Conclusion: Isolated oligohydramnios in the absence of any other maternal or fetal complicating factor is associated with need for operative intervention and adversely affects the fetal outcome, when compared to no-oligohydramnios group with normal AFI.

Key words: Amniotic fluid index, fetal outcome, oligohydramnios

INTRODUCTION

Amniotic fluid serves several roles during pregnancy. It creates physical space for fetal movement which is necessary for musculoskeletal development. It permits fetal swallowing essential for gastrointestinal tract development and fetal breathing necessary for lung development. It has bacteriostatic properties also.[1] Oligohydramnios is defined as amniotic fluid < 5 cm as originally described by Phelan et al. in 1987.[2]

Some studies had shown that amniotic fluid index (AFI) is a predictor of adverse outcome[3] while other authors have not confirmed the association.[4,5] Hence, this study...
was carried out to find the association of oligohydramnios with mode of delivery and perinatal outcome in eastern part of Nepal, beyond 28 completed weeks of pregnancy.

METHODS

A prospective hospital-based observational study was carried out in the Department of Gynecology and Obstetrics, Nobel Medical College, Biratnagar; a referral center in eastern Nepal from March 1, 2015 to February 28, 2016. All the cases that were available during the study meeting the inclusion criteria were enrolled for this study. This study includes an analysis of mode of delivery and neonatal outcome in 100 cases with a diagnosis of isolated oligohydramnios after 28 weeks of gestation. This oligohydramnios group was compared with no-oligohydramnios group (AFI 5–25 cm) after matching age group, parity, and period of gestation. Matching was performed on the basis of age categories (<20 years, 20–29 years and ≥30 years), parity (primi, multi, and grand multi) and gestation period (2 weeks interval). We included the patients who had completed the 28 weeks of gestation, AFI <5 cm, intact membrane, singleton pregnancy with cephalic presentation, and who had non-anomalous baby. Similarly, we excluded the women with <28 weeks of gestation, women with ruptured membrane, multiple pregnancy, and pregnancy-induced hypertension. Likewise, cases with fetal malpresentation and fetal congenital abnormalities were also excluded from the study.

Ethical approval from the Institutional Ethical Review Board was taken before the data collection. Informed consent was obtained from each patient prior to the study. A detailed history was taken and examination was done in patients with ultrasonography (USG) reports of AFI <5 cm. Fetal surveillance was done by USG, modified biophysical profile, and Doppler study. Decision on mode of delivery by ideal induction or operative intervention was done as per required. Oligohydramnios group and no-oligohydramnios group were then studied for mode of delivery and perinatal outcome. Intrapartum monitoring was done by Doppler and cardiotocography to detect any sign of fetal distress. Artificial rupture of membrane was done in active stage of labor and liquor status was noted. Progress of labor was recorded in the partograph. Mode of delivery, intrapartum complication, and fetal outcomes were noted. At birth, Apgar score, birth weight, and sex of the baby were recorded. Neonates who were admitted in the ward and Neonatal Intensive Care Unit (NICU) were followed till discharge.

Statistical analysis

Data were entered into excel and analysis was performed in SPSS Statistics for Windows, Version 17.0. SPSS Inc., Chicago. Frequency and percentage were used to describe the characteristics of variables. Chi-square test was used to find out association of categorical variable with the groups. The P value was set at <0.05 level.

RESULTS

During the study, a total of 8,096 deliveries were conducted. In 1 year duration, 100 patients who completed 28 weeks of gestation with AFI <5 cm and met inclusion criteria were included in the oligohydramnios group. These patients were compared with 100 patients in no-oligohydramnios group (AFI 5 to 25 cm) after matching age group, parity, and period of gestation. Both groups were followed to document the mode of delivery and neonatal outcome.

It was observed that 68% of women with oligohydramnios were in the age group 20–29 years with the mean ± standard deviation maternal age was 23.98 ± 3.89 years. By parity 58% were primigravida followed by 37% multigravidas. While analyzing booking status, 94% of oligohydramnios were unbooked. It was observed that maximum number (43%) of oligohydramnios patients were admitted in >40 weeks of gestation [Table 1].

As regards to mode of delivery, it was observed that 85% had operative delivery in oligohydramnios group which was significantly higher compared to the no oligohydramnios group [Table 2].

The absence of liquor in USG at the time of admission was the most common indication for lower segment...
caesarean section (LSCS) (24%) followed by fetal distress (16%) [Table 3]. Among the other indications of LSCS in oligohydramnios group, 14 patients underwent LSCS for prolonged second stage of labor, 3 patients for previous LSCS with oligohydramnios, and 5 patients underwent LSCS for cephalopelvic disproportion with oligohydramnios. In no-hydramnios group, 8 patients underwent LSCS for abruptio placentae in active stage of labor whereas rest 4 underwent LSCS for previous two LSCS in labor. Further, oligohydramnios was significantly associated with poor Apgar score, neonatal admission and mortality [Table 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.[8] Hence, this study was undertaken to assess the value of oligohydramnios in mode of delivery and neonatal outcomes. Present results are comparable to similar studies carried out in neighboring countries and other parts of the world.

In our study, maximum number of women were in the age group 20–29 years. However, in a study carried out by Chauhan et al., there was no significant difference in age with oligohydramnios.[9] Conversely, Jagatai et al. reported that the incidence of oligohydramnios was more in primipara in whom it was 52%, which is comparable to the study of Jandial et al. and Petrozella et al. who showed that the incidence of oligohydramnios was 60.0% in primipara which is similar to our study.[9-10] Most of the patients (43%) with oligohydramnios were of ≥40 weeks of gestation. Postdated pregnancy is a quite frequent phenomenon in our setting. Therefore to see what percentage of oligohydramnios is associated with postdated pregnancy, we included them in the study. Intrauterine growth retardation is associated with oligohydramnios, but not always. Hence, we have included patients who were diagnosed to have intrauterine growth retardation without obvious reasons such as maternal diseases-pregnancy induced hypertension, heart disease, chronic renal diseases, collagen vascular diseases, and anemia. In this study, labor was induced in 70% of oligohydromnios group patients, whereas only 27% underwent labor induction in no-oligohydramnios group. Sangeetha et al. (56%) and Guin et al. (56%) also found higher percentage of induction in oligohydromnios group.[11,12] Similarly, Casey et al. also found increased rate of induction (42% vs. 18%) in oligohydromnios when compared with no-oligohydramnios group.[3]

Various studies show different rates of LSCS in oligohydromnios patients while comparing with no-oligohydramnios group. The rate of LSCS was (85% vs. 30%) in our study. Our results correlate with the results of the study carried out by Chandra et al. and Visvalingam et al.[13,14] In addition, Nazlima and Fatima found that 71% of women underwent LSCS in oligohydromnios group.[9] The reason for higher incidence of cesarean section in our study was because in 24 (24%) patients indication for cesarean section was isolated anhydramnios. It is our common belief that less liquor is associated with certain complications. Among them, intrauterine growth retardation, birth asphyxia due to meconium aspiration syndrome and sudden death is quite common. In our set-up, there are not enough facilities for intrapartum monitoring and adequate neonatal care. Hence, to avoid this crisis we consider anhydramnios as an indication for cesarean section, which could have been deferred if better monitoring facilities were available.

Concerning the neonatal outcome, our study showed statistically significant low APGAR score in oligohydramnios (22% vs. 7%) when compared with no-oligohydramnios group. Similar results were observed by Nazlima and Fatima and Chandra et al.[9,13] On the contrary, Ahmad and Munim noticed no significant differences in APGAR scores between the two groups.[15] In the present study, there were no significant differences in birth weight of babies (P = 0.272). Results of this strongly correlate with studies done by Alchalabi et al. and Gupta et al.[16,17]
Surprisingly, oligohydramnios was found to be high in women carrying female fetus which was statistically significant ($P < 0.005$). However, there is insufficient data in previous study to support this finding. However, this can be new area of research in future. In the present study, neonatal admission was found to be significantly higher in oligohydramnios ($P = 0.026$) group when compared with no-oligohydramnios group. In this respect, many other authors Chate et al., Johnson et al. and Sriya and Singhal also found statistically significant NICU admission.$^{[18-20]}$ However, Sangeetha et al. noticed that NICU admission is not higher in oligohydramnios group when compared to no-oligohydramnios group ($P = 0.18$).$^{[11]}$ In the present study, there were 12% of neonatal death in oligohydramnios group, whereas in no-oligohydramnios group, neonatal death was only 4%. Among 12% of neonatal death, 10% were low birthweight babies and all were unbooked cases. This finding is consistent with 9.9% of Chamberlain et al. and Kwon et al. (12%).$^{[21,22]}$

**CONCLUSION**

Isolated oligohydramnios in the absence of any other maternal or fetal complicating factor is found to increase the operative intervention and adversely affect the fetal outcome, when compared to cases with normal AFI.

Oligohydramnios is being detected more often these days due to routine use of obstetric USG. Oligohydramnios is associated with a high rate of pregnancy complications and increased perinatal morbidity and mortality. In the present study, oligohydramnios (AFI <5 cm) was associated with increased caesarean delivery, particularly for anhydramnios and fetal distress. Due to intrapartum complication and high rate of perinatal morbidity and mortality, incidence of cesarean section is increasing. Hence, every case of oligohydramnios needs careful antenatal evaluation, and prevention of isolated oligohydramnios without any complicating factor is an area of further research.

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**Table 3: Indications for lower segment cesarean section**

| Indications              | Oligohydramnios group, n (%) | No-oligohydramnios group, n (%) |
|--------------------------|------------------------------|---------------------------------|
| Meconium stained liquor  | 9 (9)                        | 3 (3)                           |
| Failed induction         | 10 (10)                      | 6 (6)                           |
| Arrest of descent        | 4 (4)                        | 1 (1)                           |
| Arrest in dilatation     | 0                            | 2 (2)                           |
| Anhydramnios             | 24 (24)                      | 0                               |
| Fetal distress           | 16 (16)                      | 6 (6)                           |
| Others                   | 22 (22)                      | 12 (12)                         |

**Table 4: Neonatal outcome presented by group**

| Characteristics | Oligohydramnios group, n (%) | No-oligohydramnios group, n (%) | OR (95% CI) | $P$ value |
|-----------------|------------------------------|---------------------------------|-------------|-----------|
| Apgar >5/10     | 78 (78)                      | 93 (93)                         | 1.0         | 0.003     |
| Apgar <5/10     | 22 (22)                      | 7 (7)                           | 3.75 (1.42-10.24) | 0.003     |
| Birth weight (g)* |                              |                                 |             |           |
| >4000           | 0                            | 1 (1)                           | -           | 0.272     |
| 2500-4000       | 51 (5)                       | 61 (61)                         | 1.0         |           |
| 1500-2500       | 45 (45)                      | 34 (34)                         | 1.58 (0.85-2.95) | 0.003     |
| 1000-1500       | 4 (4)                        | 2 (2)                           | 2.39 (0.36-19.71) |           |
| <1000           | 0                            | 2 (2)                           | -           |           |
| Mean±SD (kg)    | 2.44±0.37                    | 2.68±0.49                       |             |           |
| Sex Male        | 37 (37)                      | 63 (63)                         | 1.0         | <0.001    |
| Sex Female      | 63 (63)                      | 37 (37)                         | 2.90 (1.57-5.37) |           |
| Admission No admission | 71 (71)                      | 85 (85)                         | 1.0         | 0.026     |
| Ward admission  | 18 (18)                      | 11 (11)                         | 1.96 (0.81-4.78) |           |
| NICU admission  | 11 (11)                      | 4 (4)                           | 3.29 (0.91-12.89) | 0.037     |
| Outcome Alive   | 88 (88)                      | 96 (96)                         | 1.0         |           |
| Neonatal death  | 12 (12)                      | 4 (4)                           | 3.27 (0.93-12.54) |           |

*P value and OR are calculated after clubbing small frequencies where applicable. SD = Standard deviation, NICU = Neonatal Intensive Care Unit, OR = Odds ratio, CI = Confidence interval
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Conflicts of interest
There are no conflicts of interest.

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