



Effect Of Oligohydramnios On Pregnancy Outcome After 34 weeks Of Gestation

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Abstract: This prospective study was conducted in the department of Obstetrics and Gynaecology , Kamla Nehru Hospital for mother and child, Indira Gandhi Medical College, Shimla from 1st July 2013 to 30 June 2014 in order to study the effect of Oligohydramnios on pregnancy outcome. Aim and objectives: To find out the incidence and maternal risk factors associated with oligohydramnios and perinatal outcome in oligohydramnios after 34 weeks of gestation. Cases and controls: all cases with a period of gestation more than 34 weeks with AFI ≤ 5 as cases and subsequent pregnancies with comparable parameters with no oligohydramnios .

Conclusion: An amniotic fluid index of ≤ 5 cm detected after 34 weeks of gestation is an indicator of poor perinatal outcome . In presence of oligohydramnios , an increased chances of non-reactive NST , meconium stained liquor , development of fetal distress , increased rate of cesarean section , low 5 minute Apgar score and low birth weight .

Key words : AFI , NST, LSCS , oligohydramnios , BPP

INTRODUCTION

As we know water is very essential for human existence, it is the same for a fetus in utero. Amniotic fluid index less than or equal to 5 cm defines oligohydramnios as originally described by *Phelan et al*¹. Various factors such as regulatory mechanisms or severe foetal abnormalities and maternal complications (preeclampsia/placental insufficiency) accompanied with oligohydramnios. In normal pregnancy, the volume of amniotic fluid increases to about one litre at 36 weeks , which is the maximum level . Amniotic fluid volume rises progressively during gestation until 36 weeks; the mean amniotic fluid volume is relatively consistent in the level of 700 - 800 ml. After 40 weeks, there is a progressive decline of amniotic fluid at a rate of 8% per week , with amniotic fluid volume averaging about 400ml at 42 weeks².

Early onset oligohydramnios is associated with anomalies in 15 to 25 percent and other causes are uteroplacental insufficiency, hypertension, preeclampsia, diabetes, abruption, drugs and idiopathic. *Newbould and colleagues*³ described various autopsy findings like potter syndrome, bilateral renal agenesis with dysplasia and urinary abnormalities in early onset oligohydramnios infants. Normal infants also suffer the consequences of early onset severely diminished amniotic fluid due to entrapment of fetal parts between the adherent amnion. This entrapment causes serious musculoskeletal deformities and even amputation. The purpose of taking women with oligohydramnios in this study in the third trimester is because the etiology , management, and outcome is different in late onset of oligohydramnios compared to early onset oligohydramnios. *Casey and coworkers*⁴ described an incidence of oligohydramnios of 2.3 percent after 34 weeks and found an increased risk of adverse perinatal outcomes. However, the cesarean rate was only 3 to 5 percent. Since oligohydramnios significantly influences perinatal outcome and maternal morbidity, it has prompted us to study the condition.

MATERIAL AND METHODS

This study consist of analysis of pregnancy outcome in 50 cases with diagnosis of oligohydramnios (AFI ≤ 5) by ultrasound after 34 weeks of gestation compared with 50 controls without oligohydramnios (AFI > 5) and matched for other variables like age, parity and gestational age. Oligohydramnios is defined as an amniotic fluid index (AFI) less than or equal to 5 cm. An informed written consent was obtained from all subjects.

Cases and controls were enrolled by following criteria

- Both booked and unbooked
- Correct dating
- > 34 weeks of gestation
- Singleton pregnancy
- AFI (≤ 5 as cases / > 5 cm as control)
- Intact membranes

Post-dated pregnancy, foetal anomalies, ruptured membrane ,multiple pregnancy, intrauterine death and less than 34 weeks of gestation were excluded in this study.

Detailed history including Obstetric history ,menstrual history, past history ,family history and personal history was taken . Complete examination including general physical examination, systematic examination, abdominal examination and pelvic examination was done and clinical evidence of oligohydramnios was looked and confirmed by ultrasound. Previous Obstetrics records were reviewed and baseline investigations were done. Foetal monitoring was done by DFM, VAST, NST, BPP and Doppler study. Cases with isolated oligohydramnios terminated at completed 38 weeks or as and when indicated. Controls without any complication allowed for spontaneous onset of labour or induced when indicated. During labour foetal monitoring was done clinically and cardiotocographically. Amount and nature of amniotic fluid was noted during delivery. Non - reassuring foetal heart rate pattern noted and if in spite of corrective measures like change in maternal position, hydration, oxygen inhalation, amino infusion and stopping oxytocin, if non - reassuring still persist pregnancy terminated by cesarean section or by instrumental delivery. All newborns were attended by a pediatrician.

Various outcome measures recorded:

- Labour induced or spontaneous
- Gestational age at delivery
- Color of amniotic fluid
- FHR tracing
- Mode of delivery
- Any placental or cord abnormality
- Indication for cesarean or instrumental delivery
- APGAR score at 1 min and 5 min
- Birth weight
- Admission to NICU
- Maternal and perinatal morbidity and mortality

The data recorded and tabulated. Statistical difference between the two groups was evaluated using chi square test Epi info 7.

The P value of < 0.5 was considered as statistically significant.

OBSERVATIONS

This study was performed in 50 pregnant women with an amniotic fluid index of ≤ 5 cm and completed 34 weeks of gestation and was compared with 50 pregnant women with an amniotic fluid index of > 5 cm. These groups are similar with regard to antepartum variables i.e. maternal age , gravidity, gestational age. During the study period , 228 women were admitted with oligohydramnios and total numbers of deliveries were 5768, making the incidence of oligohydramnios 3.9%. Out of a total 228 cases, 50 uncomplicated cases of oligohydramnios were included in the study. The mean age for study was 26.6 ± 4.2 years and that of the control group was 26.5 ± 3.63 years. In the present study group, 74% subjects were booked and 26% were unbooked whereas in the control group 94% were booked and 6% were unbooked. Our institution is catering to the mainly rural population hence 84% of subjects were from rural areas in the study group and 36% in the control group. There was no statistically difference between study and control group in socioeconomic status. In the study group, 58% subjects were primigravida and 42% subjects were multigravida whereas in the control group, 52% were primigravida and 48% were multigravida. There was no statistical difference in gestational age in the study and control group. The mean gestational age was 37.4 ± 1.3 weeks in the study group and $38.5 \pm$ weeks for the control group. The mean AFI for the study group was 4.04 ± 0.75 and the control group was 11.39 ± 2.48 . Total 228 cases of women with oligohydramnios, 178 cases were associated with maternal and fetal complications although they were excluded from the study group. Various maternal and fetal risk factors associated with oligohydramnios subjects were Pregnancy induced hypertension (17.11%), post dated pregnancy (13.60%), post term pregnancy (7.02%), premature rupture of membrane (14.91%), intrauterine growth restriction (16.23%), fetal anomalies (5.26%), heart disease (1.75%) and chronic abruption (2.19%). The difference was highly significant between the two groups for nonreactive and reactive NST patterns (P value < 0.001). 56% subjects in the study group and 98% subjects in the control group were reactive for NST whereas 44% subjects in the study group and 2% subjects in the control group were non reactive for NST. Fetal heart rate abnormality during

labour in the study group was variable deceleration which was present in 14% subjects and late deceleration was present in 30% subjects. However, this ominous fetal heart rate was seen in 2% of subjects in the control group. The difference was highly significant statistically (P value < 0.0001). The amniotic fluid was meconium stain in 28 % of subjects in the study group and 2% of the control group. The difference was highly significant statistically (P value< 0.0002). Labour induced 44% subjects in the study group and 2% subjects in control groups, which was highly significant statistically (P value <0.001). This also shows oligohydramnios leads to increased induction. In the study group, cesarean sections were done in 34% subjects and only 2% had cesarean section in the control group (P value 0.0001). The instrumental delivery was done in 10% of subjects in the study group and there was no instrumental delivery in the control group. This shows that oligohydramnios has a high incidence of operative deliveries. The mean birth weight was 1.94kg±0.37 in the study group and 2.69kg±0.41 kg in the control group (P value <0.001).

This shows that there is an increased incidence of low birth weight with oligohydramnios. The mean Apgar score in the study group was 6.64±0.92 at 1 minute and 8.3±2.1 at 5 minutes whereas the mean Apgar score in the control group was 7.02±0.14 at 1 minute and 9±0 at 5 minutes. The difference in Apgar score was statistically significant at 1 minute (P value= 0.02). Determination of AFI ≤5 as screening test in predicting fetal distress during labour requiring LSCS has sensitivity 94.4% and specificity 59.7%. The positive predictive value was 34% and negative predictive value was 80%. A better sensitivity and high negative predictive value makes it a good screening test (P value <0.0001). In the study group, 14 % neonates were admitted to neonatal ward for various morbidities like birth asphyxia, neonatal seizures and meconium aspiration syndrome. There were 3(6%) neonatal deaths in the study group and cause of death were respiratory distress and multiorgan dysfunction. There was no NICU admission and early neonatal death in the control group.

DISCUSSION

The amniotic fluid volume is regulated by several systems, including the membranous pathway, fetal production (urine and lung) and uptake (swallowing), and balanced of fluid movement via osmotic gradients. The assessment of amniotic fluid volumes serves an important function because decreased volumes have important pregnancy implications. A reduced amniotic fluid volume is used to monitor fetal well-being as a part of a biophysical profile. Oligohydramnios has correlated with increased risks of intrauterine growth restriction, abnormal fetal heart rate, congenital anomalies, meconium passage, and lower Apgar score in multiple studies. This study has not been done earlier in this institution hence the various outcome results are compared to the results of similar studies done by the other institutions. In our study, the incidence of oligohydramnios was 3.9%, which is comparable with studies done by *Casey et al* (2000)⁴ (2.31%) and more than the study conducted by *Syria et al* (2001)⁵ (1.5%). The mean AFI was 4.04±0.75 cms in the present study group. The mean AFI is comparable to the study conducted by *voxman et al* (2002)⁶ having a mean AFI of 3.2±1.3 cms and *Shanks A et al* (2011)⁷ having a mean AFI of 1.1±1.7cms. Various maternal and fetal risk factors associated with oligohydramnios subjects were pregnancy induced hypertension (17.1%), postdated pregnancy (13.5%), post term pregnancy (7.1%), premature rupture of membrane (14.9%), intrauterine growth restriction (16.2%), fetal anomalies (5.2%), heart disease (1.8%) and chronic abruption (2.2%). The most important maternal risk factors for oligohydramnios was pregnancy induced hypertension, which is comparable to study conducted by *Bengal et al* (2011)⁸ (16%). The most common fetal risk factor for oligohydramnios was intrauterine growth restriction, is comparable to the study conducted by *Syria et al* (2001)⁵ (16.7%), *Bangal et al* (2011)⁸ (14%) and *Gita G et al* (2011)⁹ (14.2%). The non reactive NST was present in 44% subjects in the present study which is comparable to the studies conducted by *chate P et al* (2013)¹⁰, *Syria et al* (2001)⁵ and *Nazlima et al* (2012)¹¹ where it was 38%, 41.6% and 66.6% respectively. Women in the oligohydramnios group, the occurrence of the non reactive NST incidence is more. The ominous FHR pattern in 44% subjects in the present study suggests that there is higher incidence of meconium and poor placental reserve in women with oligohydramnios group and such women should be cared for in a unit capable of managing such complications effectively. The incidence of labour induction was significantly higher in the oligohydramnios subjects(44%) as supported by *Casey et al* (2000)⁴(42%) and *Melamed N et al* (2011)¹²(50%). Because of increased risk of death in utero associated with small for gestational age, expectancy does not appear to be a safe management

option for the small gestation foetus with oligohydramnios. Hence, the rate of labour induction was significantly higher in the oligohydramnios group. In our study, 56% had normal vaginal delivery, 34% subjects had LSCS and 10% subjects had instrumental delivery, which is comparable to the studies conducted by *Grubb D K et al* (1992)¹³ and *Melamed N et al* (2011)¹². The women with the oligohydramnios group were more likely to undergo operative delivery, principally because of a higher rate of non reassuring fetal heart rate (NRFHR). The occurrence of low birth weight (<2.5 kg) was 88% in the present study group. Similarly, in the studies conducted by *Chate P et al* (2013)¹⁰, *Nazlima et al* (2012)¹¹ and *Jandial C et al* (2007)¹⁴ observed 62% , 65% and 58% low birth weight (<2.5kg) respectively. The high incidence of low birth weight may be because of chronic placental insufficiency causing fetal growth restriction. These findings suggest that in a subgroup of women with isolated oligohydramnios, the reduced levels of amniotic fluid may be the first sign of placental insufficiency. The 5 min Apgar score <7 was observed in 6% of subjects in oligohydramnios whereas *Jandial C et al* (2007)¹⁴, *Chate et al* (2013)¹⁰ and *Nazlima et al* (2012)¹¹ observed 12%, 16% and 26.9% respectively which is higher than of the present study. This may be due to better intrapartum monitoring and early intervention. The efficacy of oligohydramnios (AFI \leq 5cm) in predicting fetal distress and requirement of LSCS had a sensitivity of 94.4% and specificity of 59.9%. The positive predictive value was 34% and negative predictive value was 80%. Similarly, in the study of *Chandra P et al* (2000)¹⁵, sensitivity was 76.92%, specificity was 73%, positive predictive value was 50% and negative predictive value was 99%. *Ergun A et al* (1998)¹⁶, studied that oligohydramnios showed specificity of 18.4%, sensitivity of 94.2%, positive predictive value of 35.9% and negative predictive value of 86.7% in screening fetal distress. A better sensitivity and high predictive value makes it a good screening test. Babies born to mothers with amniotic fluid index \leq 5cm are more vulnerable for certain complications like intrapartum fetal distress, meconium aspiration syndrome and birth asphyxia. The NICU admission was 19.2% in the study by *Nazlima et al* (2013)¹¹ and 16% in the study by *Jandial C et al* (2007)¹⁴, which is comparable to the present study (14%). Among 50 cases , there were 6% neonatal deaths which is comparable to the studies by *Jandial C et al* (2007)¹⁴ (6%). Oligohydramnios is recognised as a clinical hallmark of impending severe perinatal compromise and is associated with a high rate of pregnancy complications and adverse perinatal outcome in the terms of morbidity and mortality.

CONCLUSION

An amniotic fluid index of \leq 5 cm detected after 34 weeks of gestation is an indicator of poor perinatal outcome. In the presence of oligohydramnios, the increased chances of non reactive NST, meconium stained liquor, development of fetal distress, increased rate of cesarean, low 5 min Apgar score and low birth weight. AFI is a valuable screening test for predicting fetal distress in labour requiring cesarean section. If oligohydramnios are encountered in the antenatal period, such pregnancies require extensive and rigorous antenatal and intrapartum fetal surveillance to decrease the perinatal morbidity and mortality by timely intervention.

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