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Original research article

A case-control investigation of foetal outcome in a case of oligohydramnios after 34 weeks of pregnancy.

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Abstract

Aim: To evaluate the fetal outcome in a case of oligohydramnios after 34 weeks of pregnancy.

Materials and methods: A prospective case control study was conducted in the Department of obstetrics and gynaecology, VIMS, Pawapuri, Nalanda, Bihar, India, for 18 months. 100 antenatal cases with >34 weeks of gestation with AFI ≤5 cm by sonographic estimation were included as study group and 100 women with normal AFI (8-24 cm) were included as control group. Induction of labour was done for women with high risk factors like PIH, by PGE 2 gel and accelerated with oxytocin. Labour outcome of the women were recorded includes, spontaneous /induced, nature of A F, FHR tracings, modeof delivery, indication for cesarean section or instrumental delivery. Perinatal findings such as APGAR score <7 at 1 mt and 5 mt, birth weight, admission to NICU, perinatal morbidity and mortality were noted.

Results: Study group consists of 48 % Gr 1, 52 % Gr 2 and above and control group 52% Gr 1, 48% Gr 2 and above (Chi square=21.59, p<0.0001). Antenatal complications were not seen in 70% in the study group and 58% in control group. The AFI in study and control groups. In the studygroup 70% of women had AFI below 4. The nature of the amniotic fluid was clear in 30% in study and 80% in control group. Amniotic fluid was thin meconium stained in 31% in study, 15% in control group and was thick meconium stained in 40% in study and 10% in control group (Chi square=21.57, p<0.0001). Incidence of LSCS in the study group was 55% and 19% in control group. Percentage of birth weight of babies in study and control group is shown in Table 5. Birth weight <2.5 kg was found in 60% in study group and 18% in control group with mean of 2.3 and 2.9 in study and control groupprespectively (p <0.001) statistically significant.

Conclusion: To conclude in presence of oligohydramnios a thorough evaluation for hypertension, PIH, diabetes PROM etc.should be done. An AFI ≤5 cm detected after 28 weeks was associated with adverse pregnancy outcome and poorperinatal outcome. Determination of AFI should be used as an adjunct to other fetal surveillance methods and is a valuable test for predicting fetal distress in labour requiring cesarean delivery.

Introduction

Oligohydramnios is described as a condition with decreased amniotic fluid volume relative to gestational age. The amniotic fluid (AF) is a part of the baby's life support system. Amniotic fluid is produced soon after the amniotic sac is formed at about 12 days after conception. It is first made up of effusion that is provided by the mother's circulation and then around the 20th weeks fetal urine becomes the primary substance.[1] If the measurement of AF is too low it is called oligohydramnios. If the measurement of AF is too high it is called polyhydramnios.[2] Oligohydramnios was defined as Amniotic fluid index (AFI) ≤5 (or less than the 5th percentile) or the absence of a pocket measuring at least 2 × 1 cm.[3] With the help of method of amniotic

fluid estimation by AFI using four quadrant techniques during transabdominal USG, as per described by Phelan et al in 1997, better identification of fetus at high risk can be done.[4] Oligohydramnios is a common complication of pregnancy and the incidence of this is reported to be around 1 to 5 % of total pregnancies.[5] The accurate diagnosis of oligohydramnios has become possible by ultrasonographic examination during pregnancy It can occur at any time during pregnancy, but it is most common during the last trimester. Amniotic fluid levels decrease by half once a pregnant patient reaches 42 weeks gestation. Oligohydramnios can complicate 12% of pregnancies that go past 41 weeks.[6] Usually the degree of Oligohydramnios is proportional to the severity of placental hypo perfusion and IUGR (Intra Uterine Growth Restriction). The most likely cause of oligohydramnios in IUGR babies is decreased urine output.[7] There are numerous maternal and fetal risk factors associated with a reduction of AFI. Decreased amount of amniotic fluid, particularly in third trimester, has been associated with multiple fetal risks like cord compression, musculoskeletal abnormalities such as facial distortion and clubfoot, intrauterine growth restriction, low birth weight, fetal distress in labour, meconium aspiration syndrome, severe birth asphyxia, low APGAR scores, NICU admission, congenital abnormities and stillbirths.[8] The sequel from long standing oligohydramnios includes pulmonary hypoplasia, potter's syndrome, club foot and hand and hip dislocation. However, some studies done in cases of abnormal liquor volume show that amniotic fluid index is a poor predictor of adverse outcome.[9,10] Early detection of oligohydramnios and its management may help in reduction of perinatal morbidity and mortality on one side and decreased caesarean deliveries on the other side.[11] The findings of oligohydramnios can be associated with congenital fetal abnormalities, premature rupture of membranes, uteroplacental insufficiency, growth retardation, post datism, chronic abruptio placentae, maternal illness i.e. hypertension, preeclampsia, abnormalities of twinning, history of drug intake etc. Preeclampsia, Intrauterine Growth Restriction (IUGR) and post-dated pregnancies are the commonest causes.

Materials and methods

A prospective case control study was conducted in the Department of obstetrics and gynaecology, VIMS, Pawapuri, Nalanda, Bihar, India, India for 18 months, after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

100 antenatal cases with >34 weeks of gestation with AFI ≤5 cm by sonographic estimation were included as study group and 100 women with normal AFI (8-24 cm) were included as control group.

Detailed history was taken and clinical examination was done for all cases. Clinical evidence of oligohydramnios was looked for and previous obstetric and USG reports were reviewed. Only those women who remembered their last menstrual period correctly with previous 3 regular cycles and dating scan were included for the study. USG was done for all women and AFI was calculated by 4 quadrant Amniotic Fluid measurement technique.

Women with gestational age <34 weeks and >42 weeks, polyhydramnios, PROM, multiple gestation, IUD, malpresentations, placenta previa, congenital anomalies were excluded from the study.

Induction of labour was done for women with high risk factors like PIH, by PGE 2 gel and accelerated with oxytocin. Spontaneous onset was allowed for women with no risk factors along with twice a week NST and weekly Biophysical profile (BPP). All cases were monitored thro continuous fetal monitoring during labour. After ARM nature of AF noted. Those who

developed significant variable deceleration/ late decelerations, with or without meconium stained liquor were delivered by cesarean section. All newborn babies were seen by pediatrician. Labour outcome of the women were recorded includes, spontaneous /induced, nature of A F, FHR tracings, mode of delivery, indication for cesarean section or instrumental delivery. Perinatal findings such as APGAR score <7 at 1 mt and 5 mt, birth weight, admission to NICU, perinatal morbidity and mortality were noted.

Results

Study group consists of 48 % Group 1, 52 % Group 2 and above and control group 52% Group 1, 48% Group 2 and above (Chi square=21.59, p<0.0001). Antenatal complications were not seen in 70% in the study group and 58% in control group. Mild pre-eclampsia was seen in 11% in study group and 22% in control group. Severe pre-eclampsia was present in 21% in study group and 11% in control group. Anemia was seen in 10% in control group women only. Table 1 showing the AFI in study and control groups. In the study group 70% of women had AFI below 4.

Table 1: Amniotic fluid index in study and control group

AFI	Study group number	%	AFI	Control group number	%
2 -3	35	35	8.1-11	40	40
3.1-4	35	35	11.1-14	35	35
4.1-5	30	30	14.1-17	25	25
	100			100	

The nature of the amniotic fluid was clear in 30% in study and 80% in control group. Amniotic fluid was thin meconium stained in 31% in study, 15% in control group and was thick meconium stained in 40% in study and 10% in control group (Chi square=21.57, p<0.0001). Regarding the onset of labour, induction was done for 55% in study group and 19% in control group. Remaining 45% in study group and 81% in control group women had spontaneous onset of labour.

Table 2: Mode of delivery

Mode of delivery	Study group	Control group	Total
FTND	30 (30%)	62 (62%)	92 (46%)
FTVD	15(15%)	19 (19%)	34 (17%)
LSCS	55 (55%)	19 (19%)	74 (37%)
Total	100	100	100

Incidence of LSCS in the study group was 55% and 19% in control group. This study shows that incidence of intervention is significantly more in the study group than control group with p<0.001. Table 3 showing the indications for cesarean delivery. Occurrence of fetal distress was more in study group than control group with P value <0.02 which is statistically significant.

Table 3: Indications for LSCS

Indications	Study group	Control group	Total
Fetal distress	48	15	63
Secondary arrest of descent	7	4	11
Total	55	19	74

Table 4: APGAR score <7

Time	Study group	Control group	P-value

1 minute	32 (32%)	11 (11%)	0.002
5 minutes	13(13%)	3 (3%)	0.005

Percentage of birth weight of babies in study and control group is shown in Table 5. Birth weight <2.5 kg was found in 60% in study group and 18% in control group with mean of 2.3 and 2.9 in study and control grouprespectively (p <0.001) statistically significant.

Table 5: Birth weight of the babies in study andcontrol group

Birth weight	Study group	Control group	Total
<2 kg	15 (15%)	5 (5%)	20
2.1-2.5 kg	45 (45%)	13 (13%)	58
2.6-3 kg	31 (31%)	61 (61%)	92
>3 kg	9 (9%)	21 (21%)	30
Total	100	100	200

11% of babies required NICU admission in study groupin view of meconium aspiration, birth asphyxia and seizures. Neonatal death was 3% in study group. None of the babies admitted to NICU and no perinatal mortality inControl group. The p value showed strong significance <0.001.

Discussion

Estimation of Amniotic Fluid volume is an integral part of antenatal surveillance. Reduced Amniotic Fluid carries an increased risk of complications during labour in high risk pregnancies. Relationship between sonography detected oligohydramnios perinatal morbidity and mortality has been well established by Manning and Platt.[12,13] In the present study oligohydramnios was observed in 48% in primigravida and 52 % in gravida 2 and above. According to other studies Amany H et al 38% in primigravida, 58% in gravida 2 and above, Krishna J et al 52% in primigravida, Charu J et al 60% in primigravida, Kolsoum R et al 49% in primigravida.[12-15]Patel P et al reported 58.75% in primigravida Enas M etal reported 58.2% in primigravida.[16,17] Reddy P et al reported 60% in primigravida and 40% in multigravida.[18] The present study in comparable with Krishna J et al.[14]

Manisha S et al reported 71% of oligohydramnios cases were associated with antenatal complications such as PIH39%, IUGR 29%, PROM 15%, Abruptio placenta 15%, compared to 36% in control group.[19]Deepika B et al reported 21% PIH, 55% anemia[20] Reddy et al reported Anemia in 42.67%, PIH in 25.33%.[18] Veena V et al reported PIH in 17.07%, IUGR in 46.34% in study group.[21] Bhat S et al reported PIH in 33.3%, post-datism in 50%.[22] In present study 31% of oligohydramnios cases had associated complications. Manisha S et al stated AFI 0-2 in 40%, 3 -5 in 60%.[19] Reddy P et al reported 60% in primigravida and 40% in multigravida.[18] Present study AFI 2-3 was seen in 36%, 3-5 in 64%.

Manisha S et al reported, induction of labour in 65% in study group and 21% in control group.[19] Purvi Patel et al reported induction of labour 15% in study group and6.8% in control group and spontaneous delivery in remaining cases.[16] In present study induction of labour was done for 55% in study group and 19% in control group. According to Charu J et al induction was done for 58% and spontaneous onset of labour in 28%.[13] Present study is comparable with study reported by Charu J et al.[13]

Regarding the % of vaginal delivery reported in various studies as, Charu J et al 44%, Deepika B et al 53%, Krishna J et al 58%.[13,14,20] In present study 45% of study group had vaginal delivery. Percentage of LSCS reported by, Charu J et al 56%, Deepika B et al 47%, Krishna J

et al 42%.[13,14,20] Reddy P et al reported vaginal delivery in 38.67%, LSCS in 61.33% and fetal distress was the majorindication for LSCS (42.39%).[18] Veena V et al reported vaginal delivery in 62.6% and LSCS in 35.3% in women with oligohydramnios, fetal distress was indication for LSCS in 65.7%.[22] Enas M et al reported LSCS 63.69% in study group and 28.8% in control group.[17]

When authors compare incidence of vaginal delivery and LSCS with other studies, % of LSCS was high in Purvi P et al compared with present study.[16]

In the present study Birth weight <2.5 kg was found in 60% in study group and 18% in control group with mean of 2.3 and 2.9 in study and control grouprespectively (p <0.001) statistically significant, where as Patel P et al reported 5% in study group and 2.19% in control group.[16] Baby weight <2.5 kg, was reported by Charu J et al 58%, Kolsoum R et al 29%, Krishna J et al 36%, Manisha S et al 73% and P Reddy et al 48%.[12-14,18,19] Present study is comparable with the study by Manisha S et al.[19]

In the present study APGAR score <7 in 32 % at 1minute, 13% at 5 minutes in study group and 11% at 1 minute, 3% at 5 minute in control group. Reddy P et al reported APGAR score <7 at 1 minute in 33% and at 5 minutes in 20%.[18] Veena V et al reported APGAR score <7 at 1minute in 19.51% in study group, 7.5% in control group and at 5 minutes in 12.59% in study and 2.5% in control group.[22] Enas M et al reported 5.59% at 1 minute and 2.05% at 5 minutes in study and 8.4% at 1 minute, 1% at5 minutes in control group.[17] Manisha S et al reported 55% in study,13% in control group at 1 minute.[19] . Kolsoum R et al reported 4.7% in both groups at 5 minutes, Deepika B et al reported 17.5% at 5 minutes.[12,20] Krishna J et al reported 22 % NICU admissions and 1 % neonatal death due to septicaemia.[14] According to Enas M et al NICU admission was required for 7.6% in babies of study group and 6% babies of control group.[17] There was1 still birth in study group due to 2 tight cord around neckand there was no immediate neonatal death in either study or control group.[18] Manisha S et al reported higher rates of NICU admissions, 44% in study group and 13% in control group because 57% women in study group had preterm labour.[19] According to Patel P et al NICU admissions was 20% in study group and 18.75% in control group.[16] Deepika B et al reported 36% NICU admissions and 15% perinatal mortality.[20] Reddy P et al reported NICU admission was needed in 32% and meconium aspiration syndrome was seen in 5.33%, still birth was 0.67% and perinatal death was seen in 2%.[18] In present study 11% of babies required NICU admission in study groupin view of meconium aspiration, birth asphyxia and seizures. Neonatal death was 3% in study group. None of the babies admitted to NICU and no perinatal mortality inControl group. The p value showed strong significance <0.001. Manisha S et al reported 16% neonatal death.[19] Amany H et al reported 15% NICU admission in study group and 3% in control group.[15] NICU admission was required in 16% in study reported by Charu J et al, 1% in Kolsoum R et al and 28% in Veena V et al.[12,13,21]

Conclusion

Finally, a careful examination for hypertension, PIH, diabetes PROM, and other conditions should be performed in the presence of oligohydramnios. After 28 weeks, an AFI equal to or less than 5 cm was linked to a worse pregnancy outcome and perinatal outcome. AFI determination can be used in conjunction with other foetal surveillance techniques and is a useful test for detecting foetal pain in caesarean deliveries.

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