

## A Prospective Evaluation of Maternal and Foetal Outcome in Cases of Oligohydramnios at PMCH

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### Abstract

**Aim:** To evaluate the fetal outcome in cases of oligohydramnios after 34 weeks of pregnancy at tertiary care hospital in Bihar region. **Materials and methods:** A prospective case control study was conducted in the Department of Obstetrics and Gynaecology, Patna Medical College and Hospital, Patna, Bihar, India for 1 year. 120 antenatal cases with >34 weeks of gestation with AFI  $\leq 5$  cm by sonographic estimation were included as study group and 120 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 Amniotic Fluid, FHR tracings, mode of delivery, indication for cesarean section or instrumental delivery. Perinatal findings such as APGAR score <7 at 1 minute 5 minutes, birth weight, admission to NICU, perinatal morbidity and mortality were noted. **Results:** In the present study oligohydramnios was observed in 48.33% in primigravida and 51.67% in gravida 2 and above. AFI 2-3 was seen in 35.83%, 3-5 in 64.17%. The nature of the amniotic fluid was clear in 30.83% in study and 81.67% in control group. Amniotic fluid was thin meconium stained in 31.67% in study, 14.17% in control group and was thick meconium stained in 42.5% in study and 12.5% in control group (Chi square=21.37,  $p < 0.0001$ ). Incidence of LSCS in the study group was 54.17% and 19.17% in control group. This study shows that incidence of intervention is significantly more in the study group than control group with  $p < 0.001$ . APGAR score <7 in 30.83% at 1 minute, 13.33% at 5 minutes in study group and 10.83% at 1 minute, 3.33% at 5 minutes in control group. Birth weight <2.5 kg was found in 61.67% in study group and 17.5% in control group with mean of 2.4 and 2.9 in study and control group respectively ( $p < 0.001$ ) statistically significant. 12.5% of babies required NICU admission in study group in view of meconium aspiration, birth asphyxia and seizures. Neonatal death was 2.5% in study group. None of the babies admitted to NICU and no perinatal mortality in Control group. The p value showed strong significance <0.001. **Conclusion:** Pregnancies with isolated oligohydramnios (AFI  $\leq 5$ ) at or beyond 34 weeks is associated with increased rates of non reactive NST, FHR deceleration during labor, development of fetal distress, caesarean delivery and low birth weight.

**Keywords:** Isolated oligohydramnios, Non stress test, FHR deceleration

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## Introduction

Importance of amniotic fluid volume as an indicator of fetal status was appreciated relatively recently.[1] Amniotic fluid has a number of important roles in fetal development. It cushions the fetus against trauma, has antibacterial property and promotes growth and development of gastrointestinal and musculoskeletal system.[2] It helps to maintain the fetal body temperature and plays a part in the homeostasis of fluid, and permits fetal movements.[2]

Oligohydramnios was defined as Amniotic fluid index (AFI)  $\leq 5$  (or less than the 5th percentile) or the absence of a pocket measuring at least  $2 \times 1$  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 abnormalities 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 Gynecology, Patna Medical College and Hospital, Patna, Bihar, India for 1 year, after taking the approval of the protocol review committee and institutional ethics committee.

120 antenatal cases with  $>34$  weeks of gestation with AFI  $\leq 5$  cm by sonographic estimation were included as study group and 120 women with normal AFI (8-24 cm) were included as control group.

## Methodology

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 Amniotic Fluid, FHR tracings, mode of delivery, indication for cesarean section or instrumental delivery. Perinatal findings such as APGAR score <7 at 1minute 5 minutes, birth weight, admission to NICU, perinatal morbidity and mortality were noted.

### Results

Antenatal complications were not seen in 71.67% in the study group and 58.33% in control group. Mild pre-eclampsia was seen in 10% in study group and 20% in control group. Severe pre-eclampsia was present in 22.5% in study group and 12.5% in control group. Anemia was seen in 10.83% in control group women only.

In the present study oligohydramnios was observed in 48.33% in primigravida and 51.67 % in gravida 2 and above.

Table 1 showing the AFI in study and control groups. In the study group AFI 2-3 was seen in 35.83%, 3-5 in 64.17%.

**Table 1: Amniotic fluid index in study and control group**

AFI	Study group number	%	AFI	Control group number	%
2-3	43	35.83	8.1-11	47	39.17
3.1-4	43	35.83	11.1-14	41	34.17
4.1-5	34	28.33	14.1-17	32	26.67
Total	120	100		120	100

Table 2: The nature of the amniotic fluid was clear in 30.83% in study and 73.33% in control group. Amniotic fluid was thin meconium stained in 31.67% in study, 14.17% in control group and was thick meconium stained in 37.5% in study and 12.5% in control group (Chi square=21.37, p<0.0001).

**Table 2: Nature of the amniotic fluid**

Nature of Amniotic fluid	Study group	Control group	Total
Clear	37 (30.83%)	88 (73.33%)	125 (52.08%)
Thin Meconium stained	38 (31.67%)	17 (14.17%)	55 (22.92%)
Thick Meconium stained	45 (37.5%)	15 (12.5%)	60 (25.0%)
Total	120	120	240

Table 3: Regarding the onset of labour, induction was done for 54.17% in study group and 19.17% in control group. Remaining 45.83% in study group and 80.83% in control group women had spontaneous onset of labour.

**Table 3: Onset of Labour**

Nature of Amniotic fluid	Study group	Control group	Total
Induction	65 (54.17%)	23 (19.17%)	88 (36.7%)
Spontaneous	55 (45.83%)	97 (80.83%)	152 (63.3%)
Total	120 (100.0%)	120 (100.0%)	240 (100.0%)

Table 4: Incidence of LSCS in the study group was 54.17% and 19.17% 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 4: Mode of delivery**

Mode of delivery	Study group	Control group	Total
Vaginal delivery	55(45.83%)	97(80.83%)	152(63.33%)
LSCS	65 (54.17%)	23 (19.17%)	88 (36.67%)
Total	120	120	240

Table 5: 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 5: Indications for LSCS**

Indications	Study group	Control group	Total
Fetal distress	56	18	74
Secondary arrest of descent	9	5	14
Total	65	23	88

Table 6: In the present study APGAR score  $< 7$  in 30.83 % at 1 minute, 13.33% at 5 minutes in study group and 10.83% at 1 minute, 3.33% at 5 minute in control group.

**Table 6: APGAR score  $< 7$** 

Time	Study group	Control group	P value
1 minute	37(30.83%)	13 (10.83%)	0.002
5 minutes	16(13.33%)	4 (3.33%)	0.005

Table 7: Percentage of birth weight of babies in study and control group is shown in Table 5. Birth weight  $< 2.5$  kg was found in 61.67% in study group and 17.5% in control group with mean of 2.4 and 2.9 in study and control group respectively ( $p < 0.001$ ) statistically significant. 12.5% of babies required NICU admission in study group in view of meconium aspiration, birth asphyxia and seizures. Neonatal death was 2.5% in study group. None of the babies admitted to NICU and no perinatal mortality in Control group. The p value showed strong significance  $< 0.001$ .

**Table 7: Birth weight of the babies in study and control group**

Birth weight	Study group	Control group	Total
$< 2$ kg	17 (14.17%)	7 (5.83%)	24
2.1-2.5 kg	57 (47.5%)	15 (12.5%)	72
2.6-3 kg	35 (29.17%)	70 (58.33%)	105
$> 3$ kg	11 (9.17%)	28 (23.33%)	39
Total	120	120	240

## 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 48.33% in primigravida and 51.67 % 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 et al reported 58.2% in primigravida. [16,17] Reddy P et al reported 60% in primigravida and 40% in multigravida.[18] The present study is comparable with Krishna J et al.[14]

Manisha S et al reported 71% of oligohydramnios cases were associated with antenatal complications such as PIH 39%, 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 28.33% 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 35.83%, 3-5 in 64.17%.

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 and 6.8% in control group and spontaneous delivery in remaining

cases.[16] In present study induction was done for 54.17% in study group and 19.17% 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 Percentage 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 45.83% 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 major indication 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, percentage 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 61.67% in study group and 17.5% in control group with mean of 2.4 and 2.9 in study and control group respectively (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 30.83 % at 1 minute, 13.33% at 5 minutes in study group and 10.83% at 1 minute, 3.33% 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 1 minute 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% at 5 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 was 1 still birth in study group due to 2 tight cord around neck and 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 12.5% of babies required NICU admission in study group in view of meconium aspiration, birth asphyxia and seizures. Neonatal death was 2.5% in study group.

None of the babies admitted to NICU and no perinatal mortality in Control 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.[12,13,21,22]

## Conclusion

The present study concluded that in presence of oligohydramnios, a thorough evaluation for hypertension, PIH, diabetes PROM etc. should be done. An AFI  $\leq 5$  cm detected after 28 weeks was associated with adverse pregnancy outcome and poor perinatal 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.

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