

PERINATAL OUTCOME IN IDIOPATHIC OLIGOHYDRAMNIOS WITH AMNIOTIC FLUID INDEX <5 CM COMPARED WITH NORMAL AMNIOTIC FLUID INDEX (5-25 CM) AT TERM

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ABSTRACT

BACKGROUND

The importance of amniotic fluid volume as an indicator of foetal status is a relatively recent development. Oligohydramnios, AFI<5 cm has been circumstantially associated with a variety of ominous pregnancy outcome such as perinatal death, foetal distress in labour, poor infant condition at work. We wanted to assess the association of perinatal outcome in cases with oligohydramnios with AFI<5 cm diagnosed at term and compare it with perinatal outcome of controls (AFI 5-25 cm).

METHODS

This prospective observational study was conducted in Bankura Sammilani Medical College and Hospital. 100 randomly selected cases with AFI < 5 were analysed for perinatal outcome and compared with 100 controls (AFI 5 – 25). All relevant information was recorded and was appropriately analysed with SPSS 18.0 software. Antenatal women with gestational age of 37 completed weeks and above attending our Out Patient Department or labour rooms or emergency department were included in the study.

RESULTS

Women with oligohydramnios were more commonly associated with abnormal antepartum foetal heart rate (FHR), higher rate of caesarean section, Apgar score less than 7 or NICU admission.

CONCLUSIONS

This study concluded that oligohydramnios is associated with a high rate of pregnancy complications in the form of caesarean section and increased perinatal morbidity and mortality. Early intervention in the form of induction of labour, close intrapartum monitoring, artificial rupture of membranes in active phase of labour and grading of liquor and early decision-making regarding mode of delivery are the steps to be taken to prevent poor perinatal outcome. Immediately after birth, proper resuscitation by a paediatrician is mandatory.

KEY WORDS

Oligohydramnios, AFI, Apgar, NICU

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BACKGROUND

The importance of amniotic fluid volume as an indicator of foetal status is a relatively recent development. It plays a major role in the development of foetus. Amniotic fluid allows proper growth and development of foetal long bones and musculoskeletal system. It has bacteriostatic and anti-inflammatory properties.^[1] There is gradual increase in volume with advancing gestation until approximately 31-33 weeks followed by a significant decrease towards and beyond the estimated date of confinement. Oligohydramnios is the condition of having too little amniotic fluid.

It is defined as amniotic fluid index less than 5 centimeters (or less than the 5th percentile)^[2] and has been circumstantially associated with variety of ominous pregnancy outcome, increasing maternal morbidity due to interventions and increased caesarean rate and adverse perinatal outcome due to foetal distress and foetal anoxia. Oligohydramnios can also be an idiopathic finding in a woman who had low risk pregnancies and no medical or foetal complication^[3]. The common clinical features are smaller symphysio-fundal height, foetal mal-presentation, and undue prominence of the foetal parts and reduced amount of amniotic fluid.

Assessment of amniotic fluid volume by ultrasonography is more reliable. It is calculated as the sum of the deepest vertical dimension in each quadrant of the uterus. Complications may include cord compression, musculoskeletal abnormalities such as facial distortion and clubfoot, pulmonary hypoplasia and intrauterine growth restriction. Even a moderate reduction in AFV is associated with abnormal FHR, meconium stained liquor which often requires Caesarean Section and may result in perinatal morbidity and/or mortality.^[4] Obstetricians have increasingly resorted to induction of labour or antepartum testing of

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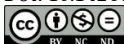
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foetal health in pregnancies complicated by decreased amniotic fluid volume. Due to wide spread application of sonogram derived estimates provoked unnecessary interventions.

The present study was carried out to assess the association of perinatal outcome in cases with oligohydramnios with AFI<5 cm diagnosed at term. The results are compared with perinatal outcome of controls (AFI 5-25 cm) in a busy peripheral tertiary care hospital.

METHODS

This is a prospective observational study carried out in Department of Obstetrics and Gynaecology, Bankura Sammilani Medical College, Bankura, West Bengal, during the period from 1st March 2016 to 30th April 2017. The sample size is 200 (100 in each cases and control group).

Routine anomaly scan will be done at 18-20 weeks for all antenatal women to rule out anomalies followed by antenatal visits for low risk female 4 weekly till 28 weeks then 2 weekly till 36 weeks followed by weekly from 36 weeks to delivery. Fundal height, symphysio-fundal height, B.P., Proteinuria will be checked in every visit. OGTT with 75 gm glucose will be done at 24-28 weeks to rule out diabetes mellitus. Antenatal women with gestational age 37 completed weeks and above attending our Out Patient Department or Labour rooms or emergency department will be included in the present study.

Inclusion Criteria

1. Patients with accurately measured gestational age.
2. Gestational age 37 completed weeks to 42 weeks.
3. Singleton pregnancies with cephalic presentation.
4. Patients with AFI <5 cm taken as study group and AFI 5-25 cm taken as control group.

Exclusion Criteria

1. Patients whose gestational age cannot be measured.
2. Pregnant women with gestational age less than 37 completed weeks.
3. Multiple pregnancies.
4. Patients complaining of premature rupture of membranes.
5. Patients with AFI >25 cm.
6. Pregnancy with any medical disorders like diabetes, chronic hypertension, new onset hypertension, cardiac diseases, renal diseases etc.
7. Foetal anomalies.
8. Patients with recurrent pregnancy loss or previous term IUD.

Sampling Method and Ethical Consideration

After taking written and informed consent and fulfilling the inclusion criteria and exclusion criteria, patients were included into the study. The study was carried out only after getting approval from the ethical committee.

Study Design

Prospective observational study.

RESULTS

Variables	Cases	Controls	Total	p Value
Age in years	21.53±2.96	21.23±2.92	21.38±2.94	0.472
BMI (kg/m ²)	20.81±0.80	20.77±0.92	20.79±0.86	0.712
SBP (mm Hg)	116.78±7.03	116.64±7.03	116.71±7.01	0.888
DBP (mm Hg)	77.76±5.09	76.26±5.35	77.01±5.26	0.043*
Gestation age	37.92±0.83	37.94±0.93	37.93±0.88	0.898

Table 1. Both Cases and Control are Comparable for Age, BMI and Blood Pressure, Gestation Age

Booked/Un booked	Cases	Controls	Total
Booked	63 (63%)	84 (84%)	147 (73.5%)
Unbooked	37 (37%)	16 (16%)	53 (26.5%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 2. Comparison of Booking Status Between Cases and Controls

Statistical analysis was done using chi-square test and p-value was found to be 0.001 which is statistically significant. Table 2: shows that out of 100 patients in cases 37% were unbooked and 16% were uncooked in control. Comparing both the groups low AFI is more common in unbooked cases compared to booked cases indicating that proper antenatal care with emphasis on amount of liquor clinically an early admission as per requirement reduces the number of cases with oligohydramnios.

Parity	Cases	Controls	Total
0	79 (79%)	77 (77%)	156 (78%)
1	17 (17%)	20 (20%)	37 (18.5%)
2	3 (3%)	3 (3%)	6 (3%)
3	1 (1%)	0 (0%)	1 (0.5%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 3. Comparison of Parity Between Cases and Controls

Statistical analysis done using Fisher Exact test with the P value 0.910 and was statistically not significant. The above table shows that there is no significant difference found in the parity of patients among the cases and control.

Bishop Score Unfavorable	Cases	Controls	Total
Unfavorable (<=6)	41 (41%)	13 (13%)	54 (27%)
Favorable (>6)	59 (59%)	87 (87%)	146 (73%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 4. Comparison Between Bishop Score Unfavorable Distribution in Cases and Controls

Statistical analysis done using Chi-Square test with P value <0.001 and was statistically significant.

Labour	Cases	Controls	Total
Spontaneous	54 (54%)	86 (86%)	140 (70%)
Induced	46 (46%)	14 (14%)	60 (30%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 5. Comparison Between Spontaneous/Induced Labour Distribution in Cases and Controls

P<0.001**, significant, chi-Square test. The induction of labour was significantly high in cases (46%).

Colour Liquor	Cases	Controls	Total
Clear	56 (56%)	82 (82%)	138 (69%)
Meconium	44 (44%)	18 (18%)	62 (31%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 6. Comparison of Colour of Liquor Between Cases and Controls

P<0.001**, significant, Chi-Square test. The incidence of meconium stained liquor in cases was 44% when compared to control group 18%.

CTG	Cases	Controls	Total
Reactive	50 (50%)	89 (89%)	139 (69.5%)
Non-Reactive	50 (50%)	11 (11%)	61 (30.5%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 7. Comparison of Foetal Heart Rate Abnormality in CTG Distribution Between Cases and Controls

P<0.001**, significant, Chi-Square test. The incidence of non-reactive CTG is more in study group.

Mode of Delivery	Cases	Controls	Total
Vaginal	31 (31%)	70 (70%)	101 (50.5%)
LSCS	61 (61%)	28 (28%)	89 (44.5%)
Instrumental	8 (8%)	2 (2%)	10 (5%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 8. Comparison of Mode of Delivery Distribution in Cases and Controls

P=0.002, significant, Chi-Square test. The above analysis shows that in cases the incidence of caesarean section rate (61%) and instrumental delivery (8%) is high when compared to control group.

Indication	Cases	Controls	Total
Foetal distress	52 (75.4%)	11 (36.7%)	63 (63.6%)
others	17 (24.6%)	19 (63.3%)	36 (36.4%)
Total	69 (100%)	30 (100%)	99 (100%)

Table 9. Comparison of Indication of Caesarean Section in Cases and Controls

On analysing the indications for caesarean section foetal distress was found to be dominant indication in cases (75.4%) when compared to control (36.7%). This difference was found to be significant by chi-square test (p <0.05%).

Birth Weight Category	Cases	Controls	Total
≤2 kg	6 (6%)	1 (1%)	7 (3.5%)
2.1-2.5 kg	58 (58%)	30 (30%)	88 (44%)
2.6-3 kg	32 (32%)	50 (50%)	82 (41%)
>3 kg	4 (4%)	19 (19%)	23 (11.5%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 10. Comparison of Birth Weight Category Distribution in Cases and Controls

P<0.001**, significant, Fisher Exact test. The incidence of low birth weight babies was high in study group than in control.

Apgar Score AT 1 Min	Case	Control
<7	74 (74%)	56 (56%)
>7	26 (26%)	44 (44%)
Total	100 (100%)	100 (100%)

Table 11. Comparison of Apgar Score Distribution at 1 Minute in Cases and Controls

Statistical analysis was done using chi-square test and p - value was 0.003 which was statistically significant.

Apgar Score at 5 Min	Case	Control
<7	25 (25%)	7 (7%)
>7	75 (75%)	93 (93%)
Total	100 (100%)	100 (100%)

Table 12. Comparison of Apgar Score Distribution at 5 Minute in Cases and Controls

Statistical analysis was done using chi-square test and p - value was 0.0002 which is statistically significant. The APGAR scores at 5 minutes were compared between the study and control groups. 25 % of the cases in study group had APGAR less than 7, compared to 7% of cases in control group.

SNCU	Cases	Controls	Total
No Admission	63 (63%)	91 (91%)	154 (77%)
Admission	37 (37%)	9 (9%)	46 (23%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 13. Comparison of SNCU Admission in Cases and Controls

Statistical analysis was done using chi-square test and p - value was <0.001, and hence statistically significant. The incidence of NICU admission in study group (37%) when compared to 9% in control group. There is a clear association between oligohydramnios and increased incidence of NICU admissions.

Perinatal Death	Cases	Controls	Total
No	98 (98%)	100 (100%)	198 (99%)
Yes	2 (2%)	0 (0%)	2 (1%)
Total	100 (100%)	100 (100%)	200 (100%)

Table 14. Comparison of Perinatal Death in Cases and Controls

P=0.497, Not significant, Fisher Exact test.

Statistical Analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis. Fisher exact test used when cell samples are very small. p -value <0.05 was considered statistically significant.

DISCUSSION

In the present study the mean age of the cases in the oligohydramnios group was 21.53±2.96 years and the mean age of the patients in the control group was 21.23±2.92 years. Our study was consistent with the study by Madhavi et al,^[5] there was no significant difference found in the age group of patients among the study and control.

In our study 37% of the cases were unbooked compared to 16% of controls and 73.5% of the overall population was booked while 23.5% was unbooked. In the present study P-value was statistically significant. Similar results were found in the study by Madhavi et al in which 32% of patients were unbooked in study group and 20 % patients were unbooked in control group.

In our study, 78% of the patients were primigravida. Similarly Jagatia et al^[6] reported that the incidence of oligohydramnios was more in primipara (52.0%) which was compatible with the study of Jandial et al^[7] who showed that the incidence of oligohydramnios was 60.0% in primigravida.

In our study 46% of the cases were induced and 14% of patients in control group were induced. In a study by Madhavi et al the induction of labour was significantly high in study group (48%). In a study by Kahkhaie et al^[8] there was significant statistically difference in induction of labour so that the induction of labour in oligohydramnios was 3.22 times greater than the control group.

In our study the incidence of meconium stained liquor was 44% in cases and 18% in control. In a study by Madhavi et al^[5], the incidence of meconium stained liquor in the study group was 36% when compared to control group which was 14 %,with P value <0.03. In a study by Chaudhari et al ^[9] 48 patients out of 156 patients with oligohydramnios had meconium staining of amniotic fluid which was 30.76%. There was a significant relation between the meconium staining of amniotic fluid and oligohydramnios.

In our study the incidence of non-reactive CTG was more in cases (50%) than in control (11%). In a study by Nazlima et al^[10] showed that out of 78 patients with oligohydramnios, 33% had normal CTG and 66% had abnormal CTG on admission. In a study by Patel et al^[11] non- reactive CTG was significantly higher in women with isolated oligohydramnios(65%).

In our study, the mode of delivery was significantly influenced by the presence of oligohydramnios. Caesarean deliveries were high (61%) in patients with oligohydramnios and most of them were due to non-reactive CTG and foetal distress. whereas the rate of caesarean deliveries was 28% in patients with AFI>=5. Our result was similar to the result of Madhavi et al where the percentage of caesarean section was 58% in cases and 30% in control.

In our study, majority (58%) of the babies in oligohydramnios group had birth weight between 2.1 - 2.5 kg. 32% had birth weight between 2.5-3.0 kg while 06% weighed below 2.0 kg. Only 4% had birth weight above 3.0 kg. In a study by Madhavi et al The incidence of low birth weight babies was as high as 56%. The rate of low birth weight was high 79.4% in studies by Youssef et al.^[12]

In the present study, the association of oligohydramnios with low Apgar score was strong. In our study, 74 % of babies belonging to the oligohydramnios group had Apgar score <7 at 1 min. 25% of the babies belonging to cases had Apgar score <7 at 5 min., The study by Nazlima et al showed 21% of

the babies to have Apgar score <7 at 5 minutes in the oligohydramnios group.

In our study, 37% of the babies born of cases needed admission in SNCU in comparison to control in which only 9% babies needed admission which was similar to the result of Madhavi et al where the incidence of NICU admission in study group (34%) when compared to 8% in control group.

In our study 2% of the babies in oligohydramnios group died. None of the babies died in the control group. In a study by Nazlima et al 2.4% perinatal deaths were present. Choudhary et al reported 2 perinatal deaths (1.3%).

CONCLUSIONS

- No significant correlation was seen between oligohydramnios and maternal age and also between oligohydramnios and gestational age.
- Incidence of operative deliveries (instrumental vaginal delivery and caesarean section) is significantly increased in patients with isolated oligohydramnios.
- The risks of meconium staining of liquor, intrapartum foetal distress, and perinatal mortality are higher in patients with AFI<5 cm.
- The goal of antepartum foetal surveillance is to identify the foetus at risk. Hence the estimation of amniotic fluid index assists the obstetrician in risk assessment. Of the various semi quantitative methods described, four quadrant technique for AFI provides a most convenient and reproducible method of evaluating amniotic fluid volume.
- Early intervention in the form of induction of labour, close intrapartum monitoring, artificial rupture of membranes in active phase of labour and grading of liquor and early decision-making regarding mode of delivery are the steps to be taken to prevent poor perinatal outcome. Immediately after birth, proper resuscitation by a paediatrician is mandatory.

REFERENCES

- [1] Munn MB. Management of Oligohydramnios in pregnancy. *Obstet Gynecol Clin North Am* 2011;38(2):387-95.

- [2] Phelan JP, Smith CV, Broussard P, et al. Amniotic fluid volume assessment with the four-quadrant technique at 36-42 weeks' gestation. *J Reprod Med* 1987;32(7):540-2.
- [3] Leeman L, Almond D. Isolated oligohydramnios at term: is induction indicated? *J Fam Pract* 2005;54(1):25-32.
- [4] Gupta R, Porwal SK, Swarnkar M, et al. the role of intravenous amino acid infusion in Oligohydramnios. *Int J Pharm Sci Res* 2012;3(10):3971-4. www.ijpsr.com
- [5] Madhavi K, Rao PC. Clinical study of Oligohydramnios, mode of delivery and perinatal outcome. *IOSR J Dental & Medical Sciences (IOSR-JDMS)* 2015;14(4)Ver. X:06-11.
- [6] Jagatia K, Singh N, Patel S. Maternal and foetal outcome in Oligohydramnios: a study of 100 cases: *International Journal of Medical Science and Public Health* 2013;2(3):724-7.
- [7] Jandial C, Gupta S, Sharma S, et al. Perinatal outcome after antepartum diagnosis of Oligohydramnios at or beyond 34 weeks of gestation. *JK Science* 2007;9(4):213-14.
- [8] Kakhhaie KR, Keikha F, Keikhaie KR, et al. Perinatal outcome after diagnosis of Oligohydramnios at term. *Iran Red Crescent Med J* 2014;16(5):e11772.
- [9] Chaudhari KR, Chaudhari KR, Desai OM. Perinatal outcome associated with Oligohydramnios in third trimester. *Int J Reprod Contracept Obstet Gynecol* 2017;6(1):72-5.
- [10] Nazlima N, Fatima B. Oligohydramnios at third trimester and perinatal outcome. *Bangladesh Journal of Medical Science* 2012;11(1):33-6.
- [11] Patel PK, Pitre DS, Gupta H. Pregnancy outcome in isolated Oligohydramnios at term. *Ntl J of Community Med* 2015;6(2):84-8.
- [12] Youssef AA, Abdulla SD, Sayed EH, et al. Superiority of amniotic fluid index over amniotic fluid pocket measurement for predicting bad foetal outcome. *Southern Medical Journal* 1993;86(4):426-9.