

# International Journal of Clinical Obstetrics and Gynaecology



ISSN (P): 2522-6614  
ISSN (E): 2522-6622  
© Gynaecology Journal  
[www.gynaecologyjournal.com](http://www.gynaecologyjournal.com)  
2021; 5(2): 224-227  
Received: 10-01-2021  
Accepted: 15-02-2021

**Dr. Rahul Khatri**  
MBBS, Junior Resident,  
Department of obstetrics and  
Gynaecology, MGM Medical  
College and Research Centre,  
Navi Mumbai, Maharashtra, India

**Dr. Bhoomika Jain**  
MBBS, Junior Resident,  
Department of obstetrics and  
Gynaecology, MGM Medical  
College and Research Centre,  
Navi Mumbai, Maharashtra, India

**Dr. Sabrina Mhapankar**  
MBBS, MD OBGY, Assistant  
Professor Department of Obstetrics  
and Gynaecology, MGM Medical  
College and Research Centre,  
Navi Mumbai, Maharashtra, India

**Dr. Sushil Kumar**  
MBBS, MD OBGY  
Professor and HOD of department  
of Obstetrics and Gynaecology,  
MGM Medical College and  
Research Centre, Navi Mumbai,  
Maharashtra, India

**Corresponding Author:**  
**Dr. Rahul Khatri**  
MBBS, Junior Resident,  
Department of obstetrics and  
Gynaecology, MGM Medical  
College and Research Centre,  
Navi Mumbai, Maharashtra, India

## A Study of perinatal outcome in cases of oligohydramnios at term

**Dr. Rahul Khatri, Dr. Bhoomika Jain, Dr. Sabrina Mhapankar and  
Dr. Sushil Kumar**

**DOI:** <https://doi.org/10.33545/gynae.2021.v5.i2d.893>

### Abstract

Quantitative estimation of amniotic fluid volume is a part of routine obstetric scan. Oligohydramnios is associated with a high risk of adverse perinatal outcome. In this study perinatal outcome of amniotic fluid index suggestive of oligohydramnios at term is assessed, oligohydramnios is a high-risk pregnancy and proper antepartum care, intensive fetal surveillance and intrapartum care are required in patient with oligohydramnios. Every case of oligohydramnios needs careful antenatal evaluation, parental counseling, individualization, decisions regarding time and mode of delivery.

**Keywords:** Oligohydramnios, AFI at term, Perinatal outcome in Oligohydramnios, Risk factors for Oligohydramnios

### Introduction

Quantitative estimation of amniotic fluid volume is a part of routine obstetric scan. AFI is calculated by adding the depth in centimeters of the largest vertical pocket in each four quadrants (Phelan *et al*)<sup>[1]</sup>. Oligohydramnios is associated with a high risk of adverse perinatal outcome<sup>[2-3]</sup>. On the other hand oligohydramnios is a poor predictor for adverse outcomes<sup>[4, 5]</sup>. An explanation for these seemingly conflicting observation lies in the fact that not all oligohydramnios is the same. If there is evidence to prove the pregnancy outcome, it could save a lot of interventions like induction of labor and cesarean section, which is definitely in the better interest of the patient.

### Aims and Objectives

- To study the perinatal outcome in term oligohydramnios.
- To compare the perinatal outcome in term oligohydramnios with control group.

### Methodology

Present study is a hospital-based study on perinatal outcome in term gestation with AFI less than 5cm and control group AFI > 5cm, was carried out.

Ethical clearance was obtained for this study from the institution. Written informed consent was taken. History regarding age, parity, duration of gestation, menstrual history, obstetric history and history of any complications in present pregnancy were noted. General clinical examination was done. Pulse rate, blood pressure & temperature were noted. Symphysio-fundal height was measured in centimeters. Obstetric examination is done of patients in labour. Necessary investigations were done. Contraction stress test /non stress test was done. An ultrasound examination was done for foetal wellbeing and AFI was measured. The deepest, unobstructed and clear pocket of amniotic fluid was visualized and the image was frozen. The ultrasound calipers were manipulated in such a way to measure the pocket in a strictly vertical direction. The process was repeated in each of the four quadrants and pocket measurement was summed to give the AFI. The patients were followed up by observing the mode of delivery, if delivery made by caesarean section, the indication was recorded, duration of labour recorded. The condition of babies was assessed by birth weight, apgar score, color of liquor and the need for intensive care. These babies were followed till 28 days after birth.

- Doppler study of umbilical vessels and mean volume of blood flowing per min
- Study design was prospective study.
- About 50 cases in AFI is 5cm or less (Study group) at or more than 37 weeks And 50 Cases in control group (AFI 5cms to 25cms) at or more than 37 weeks.

**Inclusion criteria**

- Singleton pregnancy
- Without any associated surgical co-morbidities
- With cephalic presentation
- With reassuring CTG/NST on admission
- At >37 weeks gestation, < or equal to 40 weeks gestation
- AFI < or equal to 5 cm
- Inclusion criteria for the control group was the same as the above, except AFI 5 to 25cm.

**Exclusion criteria**

- Patients with premature rupture of amniotic membranes.
- Multiple gestation.
- Patients with previous uterine scar.

**Outcome**

## Maternal Outcomes

- Induction/augmentation of labor

## LSCS/instrumental delivery/duration of labor

## Neonatal Outcomes

- Birth weight in gms.
- APGAR score at 1 min.
- Fetal distress/MSAF
- NICU admission/ duration of stay
- Neonatal mortality/morbidity
- Possible risks to the patient:

There was no risk involved in this study. No adverse effect reported by any textbook or research paper about adverse effect of USG in labour.

- Possible benefits to the patient:

The proper evaluation helped in early management and prevention of complications in relation with liquor volume.

**Results****Table 1:** Distribution according to age

Age group	Case (N)	Case (%)	Control (N)	Control (%)
less than 20 years	4	8.00%	2	4.00%
20 to 30 years	44	88.00%	45	90.00%
more than 30 years	2	4.00%	3	6.00%
Chi-square	0.878	P value	0.645	

Most of the cases were from age group 20 to 30 years (88%) and also controls were from same age group (90%)

No significant association was found.

**Table 2:** Distribution according to parity

Parity	Case (N)	Case (%)	Control (N)	Control (%)
Multi	24	48.00%	25	50.00%
Primi	26	52.00%	25	50.00%
Chi-square	0.04	P value	0.841	

Significant association was found between parity and oligohydramnios.

**Table 3:** Distribution according to high-risk status

High risk	Case (N)	Case (%)	Control (N)	Control (%)
Breech	1	2.00%	1	2.00%
Postdated	10	29.00%	10	20.00%
Preeclampsia	18	36.00%	14	28.00%
Previous LSCS	1	2.00%	6	12.00%
Uncomplicated	20	40.00%	19	38.00%
Chi-square	4.001	P value	0.00	

Significant association was found. Most of the cases (36%) were in high of preeclampsia. And most of the controls were also having high risk of preeclampsia (28%)

**Table 4:** Distribution according to Non stress test

NST	Case (N)	Case (%)	Control (N)	Control (%)
NR	29	58.00%	18	36.00%
R	21	42.00%	32	64.00%
Chi-square	4.85	P value.	0.028	

Significant association was found.

Non-reactive were 58% cases and 36 % controls. Rest of the cases and controls were reactive (42% and 64% respectively)

**Table 5:** Distribution according to onset of labour

Onset of labour	Case (N)	Case (%)	Control (N)	Control (%)
I	20	40.00%	12	24.00%
S	30	60.00%	38	76.00%
Chi-square	2.941	P value	0.086	

No significant association was found. Induced labour was seen in 40% cases while 60% had spontaneous labour. Induced labour was seen in 24% controls while 76% had spontaneous labour.

**Table 6:** Distribution according to colour of liquor

Color of liquor	Case (N)	Case (%)	Control (N)	Control (%)
Clear	22	44.00%	36	72.00%
Meconium stained	28	56.00%	14	28.00%
Chi-square	8.04	P value	.005	

Significant association was found.

Colour of liquor was clear in 44% cases and it was clear in 72% controls.

**Table 7:** Distribution according to mode of delivery

Mode of delivery	Case (N)	Case (%)	Control (N)	Control (%)
LSCS	20	40.00%	12	24.00%
Normal vaginal	30	60.00%	38	76.00%
Chi-square	2.941	P value	0.086	

No significant association was found. Mode of delivery was LSCS in 40% cases, and mode of delivery was vaginal in 60 % cases.

**Table 8:** Distribution according to APGAR score

APGAR	Case (N)	Case (%)	Control (N)	Control (%)
Below 4	2	4.00%	2	4.00%
4 to 7	23	46.00%	18	36.00%
7 and above	25	50.00%	30	60.00%
Chi-square	5.401	P value	0.00	

Significant association was found. APGAR score was 7 and above in 50% cases and 60% controls.

**Table 9:** Distribution according to NICU admission

NICU admission	Case (N)	Case (%)	Control (N)	Control (%)
No	28	56.00%	41	82.00%
Yes	22	44.00%	9	18.00%
Chi-square	7.901	P value	.005	

Significant association was found. NICU admission was seen in 44% cases and 18% controls.

## Discussion

This study is a hospital-based study on perinatal outcome in term gestation with AFI less than 5cm and control group AFI > 5cm, was carried out.

History regarding age, parity, duration of gestation, menstrual history, obstetric history and history of any complications in present pregnancy were noted. General clinical examination was done. Pulse rate, blood pressure & temperature were noted. Symphysis-fundal height was measured. Uterine size, presentation & adequacy of amniotic fluid clinically, was noted. Foetal heart rate was counted. Per- speculum & per -vaginum examination was done to see any rupture of the membranes. Necessary investigations were done. Non stress test was done. An ultrasound examination was done for foetal wellbeing and amniotic fluid index was measured. The deepest, unobstructed and clear pocket of amniotic fluid was visualized and the image was frozen. The ultrasound callipers were manipulated in such a way to measure the pocket in a strictly vertical direction. The process was repeated in each of the four quadrants and pocket measurement was summed to give the AFI. The patients were followed up by observing the mode of delivery, if delivery made by caesarean section, the indication was recorded. The condition of babies was assessed by birth weight, APGAR score, color of liquor and the need for neonatal admission. These babies were followed till 28 days after birth.

In the present study most of the patients were of age group between 20 to 30 years. 88% of the cases were of age group 20 to 30 years .90% of the study were of age group 20 to 30 years.

No significant association was between the age group and oligohydramnios. Most of the case and control groups were of the age group of 20 to 30 years because most of the Indian women get married and become pregnant at that age, which is similar to Dr. G. Prathasaradhi Reddy [6] study in which the maximum number of patient's belong to the age group of 21-25 years and Pawanpreet Kaur [7] study in which most of the patients were of age group 20-30 years. There was no difference in the age group between the case and control statistically.

In the present study 52% of the cases were primigravida and 48% were multigravida. In control group primigravida and multigravida were 50% each. There is a significant difference between primigravida and multigravida in the case group and the 'p' value is 0.4, which is significant, so the association was found between parity and oligohydramnios. More primipara patients have oligohydramnios. Incidence of oligohydramnios is more in primipara as the main cause of oligohydramnios i.e preeclampsia is most commonly seen in primigravida's. In concordance to the present study, there was a similar study done by Dr. Parthasaridhi Reddy [6] in which the percentage distribution of cases in primigravida's and multigravida's were 60% and 40% respectively. A contradictory study to this was a study done by Awdhut Tiparse [8] in which oligohydramnios was associated with multipara's more than the primipara's, however the 'p' value was 1.0 and there was no suggested association between parity and oligohydramnios was found. They explained this as there is increased age in multiparity which is one of the main causes for congenital anomalies. It can be concluded that preeclampsia in which there is vascular changes in umbilical artery is more common in primigravida's, therefore oligohydramnios is more common in primigravidas. In our study 36% of the cases and 28% of the control group were having preeclampsia. Significant association was found between oligohydramnios and preeclampsia in both case and control group, 'p' value is found to be 0.0001 which is statistically significant.

Reason for oligohydramnios in preeclampsia can be explained as there is chronic placental insufficiency which lead to oligohydramnios in term pregnancy.

In concordance to the present study, study done by Pawanpreet Kaur [7], the incidence of preeclampsia in case and control were 32% and 32% respectively, which is more than other high risks. Also a study done by Dr. G. Parthasaradhi Reddy [6], most common cause of oligohydramnios is hypertensive disorder in pregnancy i.e 25.35%. In the present study, non-reactive NST was found in 58% of cases and 36% of control, rest of the cases and control were reactive and the 'p' value was found to be 0.028 which is significant, which infers that there is association between NST and oligohydramnios. In concordance to the present study, study of Pawanpreet Kaur [7] found that the non-reactive NST rates are high in women with oligohydramnios i.e. 38% and significant association was found. In study by Awdhut Tiparse [8], 30% of oligohydramnios patients had non-reactive NST. In the present study induction of labour was seen in 40% of cases while 60% had spontaneous labour. Oligohydramnios had more spontaneous onset of labour. However significant association was not found. A contradictory study done by Pawanpreet Kaur [7] say's that induction of labor was required more in oligohydramnios. In was done in 54% of women with oligohydramnios and 24% with control group, 'p' value was found to be 0.001 which is statistically significant. Patients with oligohydramnios were not induced at term in the present study and were waited for spontaneous onset of labour after doing Doppler at term, patients with only Doppler changes were induced. In the present study meconium-stained liquor was found in 56% of cases and 28% of control, 'p' value was found to be 0.005, which is statistically significant. Meconium-stained liquor is more associated with oligohydramnios.

In concordance to this study, Pawanpreet Kaur [7], 60% of the study group and 26% of the control group had meconium-stained liquor. The difference in occurrence of meconium-stained amniotic fluid between 2 groups was statistically significant. Passage of thick meconium suggests severity due to prolong hypoxia. In the present study mode of delivery was LSCS in 40% of cases and 24% of control. However, 60% of cases and 76% of control had vaginal delivery. No significant association was found between mode of delivery and oligohydramnios. In the present study more patient's delivered vaginally because other indications for LSCS in patients with oligohydramnios like CPD, previous LSCS, infertility and bad obstetric history were excluded from the study. The main concern in the patient's with fetal distress is to deliver the baby immediately, either vaginally or through LSCS.

In the present study most of the patients were favourable to deliver vaginally as we have excluded the rest. In concordance, the study done by Pawanpreet Kaur [7], 62% of study group and 78% of control group had vaginal delivery. 48% of the study group and 22% of control had LSCS. The 'p' value was found to be 0.87 which was statistically not significant. In contradiction to the present study, the study done by Dr. G. Parthasaradhi Reddy [6], LSCS rate is 61.3% and vaginal delivery's 38.6%. In this study LSCS is more than vaginal delivery because unlike present study the cases with CPD, previous LSCS, infertility and bad obstetric infertility were also the indication for LSCS.

In the present study, APGAR score was less than 7 in 50% of case group and 40% of control group and 'p' value was found to be 0.0001, which is statistically significant. Infers that oligohydramnios is associated with low APGAR at birth. Oligohydramnios has more chances of foetal distress due to meconium-stained liquor, cord compression, IUGR and these

babies will have low APGAR. In concordance, Dr. G. Parthasaridhi Reddy <sup>[6]</sup> study, in which 50% of case and 30% of control had APGAR less than 7. In the present study, NICU admissions were more in case i.e. 44% as compared to control i.e. 18%. The 'p' value was found to be significant (0.005); oligohydramnios is associated with more NICU admissions.

It's well explained as the main cause of oligohydramnios is preeclampsia which leads to IUGR, which is associated with fetal distress and passage of meconium and poor APGAR score.

In concordance, Pawanpreet Kaur <sup>[7]</sup> study, 40% of the study group and 12% of control group had NICU admissions and the 'p' value (<0.001) was found to be significant. Therefore, oligohydramnios is associated with NICU admissions.

### Conclusion

- Pregnancy induced hypertension, post-dated pregnancies are the commonest causes of reduced amniotic fluid during third trimester of pregnancy.
- Oligohydramnios associated with IUGR carries a poor perinatal outcome (increased neonatal death, NICU admission, increased rate of caesarean section for fetal distress, very low birth weight). Hence they need good neonatal care.
- Oligohydramnios is one of the indicators of poor perinatal outcome.
- From this study, we conclude that oligohydramnios is a high risk pregnancy and proper antepartum care, intensive fetal surveillance and intrapartum care are required in patient with oligohydramnios.
- Every case of oligohydramnios needs careful antenatal evaluation, parental counselling, individualization, decisions regarding time and mode of delivery.

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