



## RESEARCH ON PREVALENCE OF OLIGOHYDRAMNIOS IN THIRD TRIMESTER OF PREGNANCY AND ITS OUTCOME

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### ABSTRACT

The aim of the study is to find out the prevalence of oligohydromnios in third trimester of pregnancy and its outcome. The main objective is to study the risk factors, complications associated with oligohydramnios and its impact on fetal outcome. A prospective observational study was carried out in obstetrics and gynecology hospital in Erode, Tamil Nadu. 100 patients with gestational age from 30-40 weeks with Amniotic Fluid index AFI<5cms with intact membranes were analysed for perinatal outcome during the period April 2018 to September 2018. Out of 100 patients, 25 patients were reported to be with oligohydramnios. More patients were reported in the age group of 21-25years. 80% of patients showed primigravida and 20% of patients showed multigravida. 64% of people showed gestational period of 35-37weeks. All patients showed AFI  $\leq 25\%$ . The frequency of different risk factors in pregnancy included gestational diabetes mellitus (GDM) (24%), anemia (16%), premature rupture (12%), preeclampsia (12%) and with non-maternal factors (36%). Lower Segment caesarian Section (LSCS) was done in 96% of patients and 4% of patients undergone normal vaginal delivery. The LSCS was highly indicated due to oligohydromnios in 48% of cases and its associated causes such as fetal distress 32%, intrauterine growth retardation 12%, malformation 4%and failed induction 4%. All 25 babies of oligohydramnios patient showed Appearance, Pulse, Grimace, Activity, and Respiration (APGAR) score of above  $\geq 7$  and associated fetal outcomes such as Respiratory Distress Syndrome 32%, and Preterm 12%. The patients in primigravida are more prone to oligohydramnios with associated factors such as GDM and anemia. In the third trimester, the complications resulting in the caesarian section was high in order to improve the fetal outcome. So timely screening for Amniotic fluid index (AFI) between intrapartum and postpartum pregnancy, proper antenatal checkup and lifestyle changes in patients helps to reduce the maternal risk factors and improve the fetal outcome.

**KEYWORDS:** *Oligohydromnios, Amniotic fluid index, anemia, gravida, gestational age*



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## INTRODUCTION

Amniotic fluid plays a major role in pregnancy. It maintains the homeostasis of fluid and electrolytes and fetal body temperature. It creates a physical space for the musculoskeletal development, promotes normal lung development and helps to avert compression. The amniotic fluid volume is that the result of interaction of the maternal and fetal fluid balances; fetal surface of the placenta and fetal body surface and directly from the mother in the initial period of gestation.<sup>1</sup> The amniotic fluid is measured by amniotic fluid index by using ultrasonography. An Amniotic Fluid Index from 8-20 cm is considered normal while the Amniotic Fluid Index from 5.1-8cm is considered as borderline and < 5cm is considered as low Amniotic Fluid Index.<sup>2</sup> Amniotic fluid surrounds and protects the fetus in the amniotic cavity. It provides a cushion against the constricting gravid uterus allowing the fetus room for movement, growth and protecting it from external trauma.<sup>3-</sup><sup>4</sup> The amount of amniotic fluid gets varied depending upon the gestation period. The amount increases rapidly with the growth of the fetal products, averaging 50ml at 12 weeks of pregnancy to 400 ml at 20 weeks of pregnancy. The average amount of AFV in 3<sup>rd</sup> trimester is 700-800 ml. If the AFI is less than 5cm the condition is called oligohydramnios. Oligohydramnios is a common complication of all pregnancies and the incidence of this is reported to be around 5% of pregnancy. In some region the increase in oligohydramnios was due to increased environmental temperature which leads to maternal dehydration that causes fetal dehydration and urine output decreases which result in decreased amniotic fluid volume.<sup>5</sup> Abnormality of fluid volume can interfere directly with fetal development causing structural anomalies such as pulmonary hypoplasia, fetal hypoxia, neural tube defect and gastrointestinal obstruction.<sup>6</sup> The condition associated with oligohydramnios are premature rupture of the membrane, intrauterine growth retardation, maternal factors such as Gestational Diabetes Mellitus (GDM), pre-eclampsia, maternal hydration, anemia and idiopathic. This leads to fetal complication such as low birth weight, fetal distress and fetal death, Intrauterine Growth Retardation (IUGR) and increased Neonatal Intensive Care Unit (NICU) admission.<sup>7</sup> The maternal outcomes such as preterm delivery and labor induction in women with borderline AFI were considerably higher than those in normal group. Birth asphyxia was more common

in babies delivered to patients with oligohydramnios. Neonatal morbidity was mainly due to meconium aspiration and neonatal sepsis.<sup>8</sup> This leads to increased LSCS and instrumental delivery in the mother during the pregnancy. The post-dated pregnancy, pregnancy induced hypertension and fetal congenital anomalies were the common complications associated with oligohydramnios. Pregnancy induced hypertension and post-dated pregnancies are the commonest causes of reduced amniotic fluid during the third trimester of pregnancy.<sup>9</sup> The present study aims to find out the prevalence of oligohydramnios in third trimester of pregnancy, outcome and its associated causes. The main objective of the study the risk factors, complications associated with oligohydramnios and its impact on fetal outcome.

## MATERIALS AND METHODS

A prospective observational study was carried out in obstetrics and gynecology hospital in Erode, Tamil Nadu. Ethical approval was obtained from the institutional review board (JKKNCP/ETHICS\_PRACTICE/ 018PDS13). In this study, 100 patients with gestational age from 30-40 weeks with AFI <5cms with intact membranes were analysed for perinatal outcome during the period April 2018 to September 2018. All patients in third trimester with AFI less than or equal to 5cm, preeclampsia, gestational diabetes, maternal dehydration, eclampsia, anemia, ruptured membranes were included in the study. Exclusion criteria were patients with multiple gestation, intrauterine death of fetus, polyhydramnios, thyroid disorder, CardioVascular Disease, bleeding and known case of diabetes. Other than those, patient demographics, gravida, gestational week, menstrual history, mode of delivery and outcomes of both mother and fetus were studied. As per our knowledge there is no study conducted in our study area to assess the prevalence of oligohydramnios and its associated causes. The study may be helpful to find out the prevalence in our area.

## RESULT AND DISCUSSION

Out of 100 patients, 25 patients were reported with oligohydramnios (25%) and 75 patients were reported with no oligohydramnios (75%). The 48% of patients with oligohydramnios belong to the age group of 21-25 years as mentioned in table 1.

**Table 1**  
*Age wise distribution of study population*

S.No	Age (yrs)	Number of patients (n=25)	Total Percentage (%)
1	18-20	7	28
2	21-23	8	32
3	24-26	5	20
4	27-29	5	20
5	30	0	0

Based on gravida, 80% of patients were in primigravida. 64% reported in gestational period of 35-37 weeks as mentioned in table 2 and 3.

**Table 2**  
*Distribution of patients according to gravida*

Gravida	Number of patients (n=25)	Total Percentage (%)
Primi Gravida	20	80
Multi Gravida	5	20

**Table 3**  
*Distribution of patients according to Gestational Period (weeks)*

S.No	Gestational Period (weeks)	Number of cases (n=25)	Total Percentage (%)
1	29-31	1	4
2	32-34	2	8
3	35-37	16	64
4	38-40	6	24

All patients showed AFI less than equal to 25% table 4. The frequency of different risk factors in pregnancy included 24% gestational diabetes, 16% anemia, 12% premature rupture, 12% preeclampsia

and 36% with non maternal factors as mentioned in table 5. The 96% of patients underwent LSCS and 4% underwent normal vaginal delivery as mentioned in table 6.

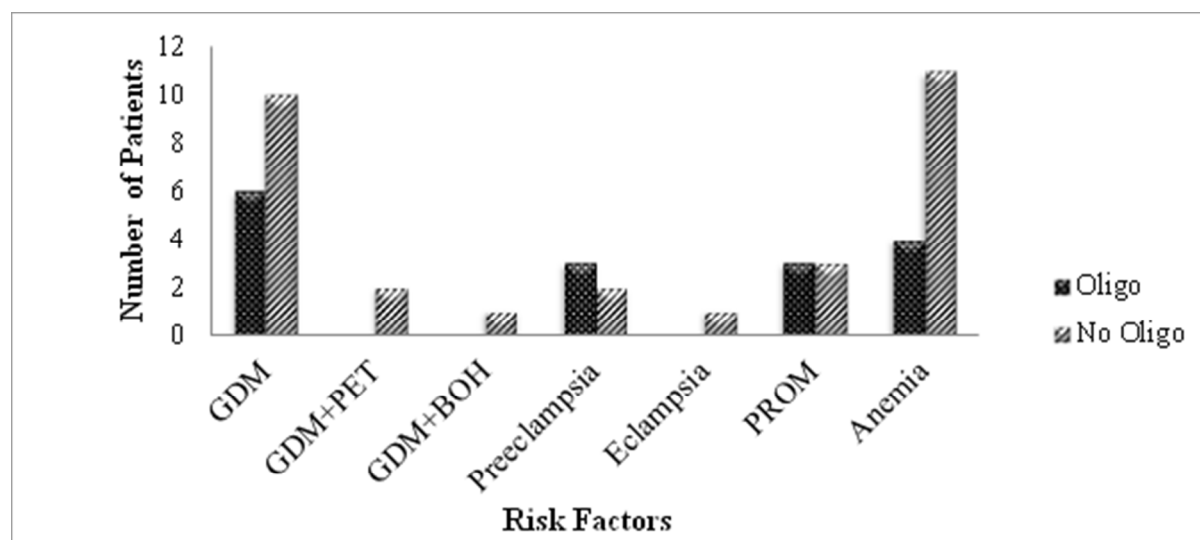
**Table 4**  
*Classification of patients based on Amniotic Fluid Index*

Amniotic fluid index	Number of cases (n=25)	Total percentage (%)
Normal( >10cm)	0	0
Borderline (>5 to ≤10cm)	0	0
Low (≤5cm)	25	100

**Table 5**  
*Risk factors associated during pregnancy*

S.No	Risk factors	Oligohydramnios n = 25 (%)	No Oligohydramnios n = 75 (%)	Total number of cases n = 100 (%)
1	GDM	6 (24%)	19(25.33%)	25
2	Anemia	4(16%)	11(14.6%)	15
3	PROM	3(12%)	5(6.6%)	8

4	Preeclampsia	3(12%)	4(5.33%)	7
5	GDM+Preeclampsia	0	2(2.6%)	2
6	GDM+BOH	0	1(1.33%)	1
7	Eclampsia	0	1(1.33%)	1
8	Non- Maternal Factors	9(36%)	32(42.6%)	41



1. BOH- Bad Obstetric History, 2. PROM- Premature Rupture of Membranes, 3. PET- Preeclampsia

**Figure 1**  
*Risk factors associated during pregnancy*

**Table 6**  
*Mode of delivery*

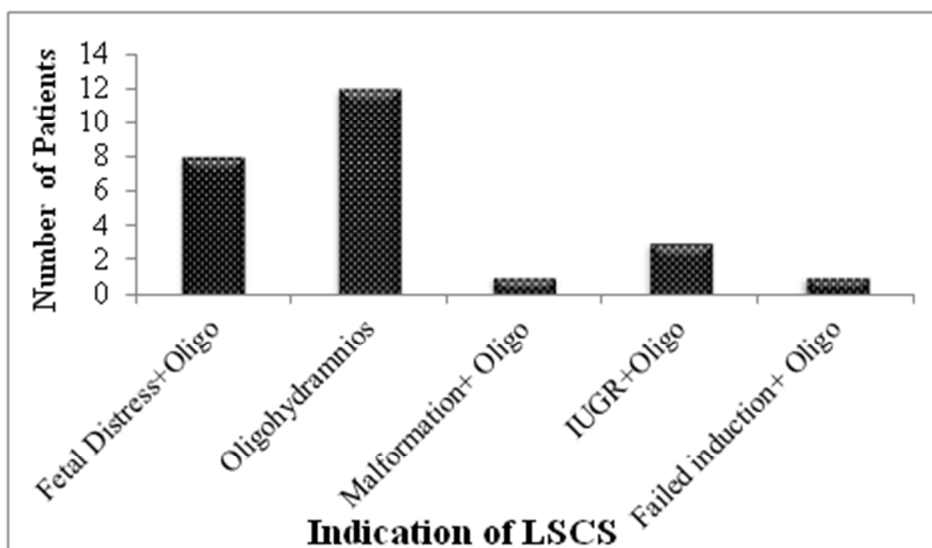
Type of delivery	Number of cases (n=25)	Total Percentage (%)
LSCS	24	96
NVD	1	4

The LSCS was highly indicated due to oligohydramnios 48% and its associated causes such as fetal distress 32%, intrauterine growth retardation 12%, malformation 4%, and failed induction 4% as mentioned in table 7. All 25 babies

of oligohydramnios patient showed APGAR score of above  $\geq 7$  as shown in table 8 and associated fetal outcomes such as Respiratory Distress Syndrome (RDS) 32%, Preterm 12%, Low birth weight 12%, meconium stained 1% as mentioned in table 9.

**Table 7**  
*Indications for LSCS in oligohydramnios*

S.No	Indications	Number of cases (n=24)	Total Percentage (%)
1	Oligohydramnios	11	46
2	Fetal distress+Oligohydramnios	8	33
3	IUGR+Oligohydramnios	3	13
4	Malformation+Oligohydramnios	1	4
5	Failed Induction + Oligohydramnios	1	4



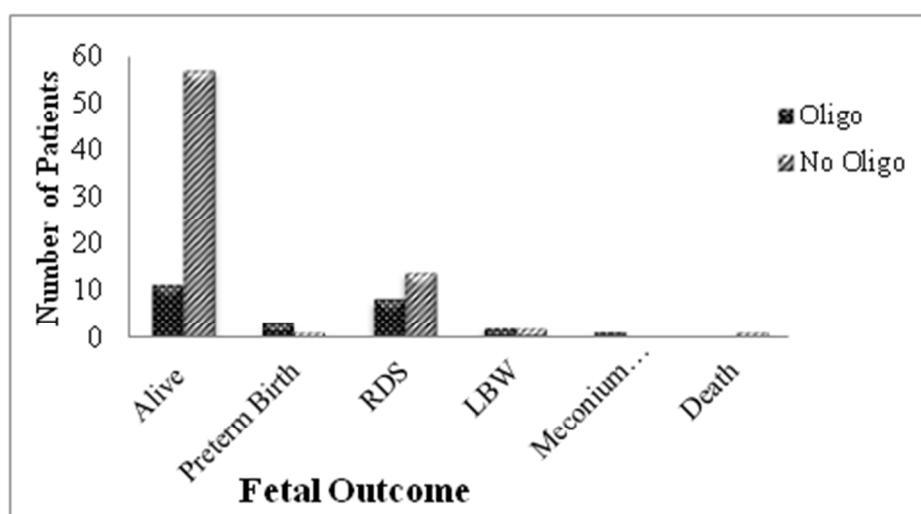
**Figure 2**  
*Indication for LSCS in oligohydramnios*

**Table 8**  
*APGAR score of babies*

APGAR Score at 5min	Number of Patients (n=25)	Total Percentage (%)
$\geq 7/10$	25	100
$< 7/10$	0	0

**Table 9**  
*Fetal outcomes of babies*

S.no	Fetal outcomes	Oligohydramnios (n=25)	No Oligohydramnios (n=75)	Total number of cases n=100 (%)
1	Alive and healthy	11(44%)	57(76%)	68
2	RDS	8(32%)	14(18.6%)	22
3	Preterm birth	3(12%)	1(1.3%)	4
4	LBW	2(8%)	2(2.6%)	4
5	Meconium Stained	1(4%)	0	1
6	Death	0	1(1.3%)	1



**Figure 3**  
*Fetal outcome*

## DISCUSSION

The patients with age group of 21-25 yrs showed increased risk to oligohydramnios as most women have their normal menstrual cycle between the age group of 21-25 and our results were at par with the study conducted by Krishna J *et al.*,<sup>3</sup> in the year 2013 and Chaitra *et al.*,<sup>10</sup> in the year 2016. The prevalence of oligohydramnios were highly reported in patients having primigravida which is similar to the study conducted by Mathuriya G *et al.*,<sup>2</sup> in the year 2017 and Chaitra *et al.*,<sup>10</sup> in the year 2016. The prevalence of oligohydramnios are reported highly in patients with gestational age of 35-37 weeks which is comparable to the study conducted by Moses V *et al.*,<sup>4</sup> in the year 2016. This may be due to either uterine insufficiency or reduced fetal urine production. Other than that maternal fluid balance plays a role during the late gestation.<sup>11</sup> The amniotic fluid index were classified into normal ( $>10\text{cm}$ ), borderline ( $> 5\text{cm}$  to  $\leq 10\text{cm}$ ) and low ( $\leq 5\text{ cm}$ ) in which 25 patients shows low AFI. AFI less than or equal to 5 cm is considered as oligohydramnios shows more risk which is similar in the study conducted by Padma S *et al.*,<sup>12</sup> in the year 2016. The reason behind the decreased AFI is maternal dehydration, placental insufficiency, preeclampsia, gestational diabetes etc., In our study, the patient with GDM showed more risk to oligohydramnios. The study conducted by Maryam A *et al.*,<sup>8</sup> found that preeclampsia is highly associated during pregnancy. Similarly, the study conducted by Sasahara J *et al.*,<sup>11</sup> found that Preeclampsia and PROM show more risk to oligohydramnios than gestational diabetes mellitus which is different when compared to our study. The 24 patients with oligohydramnios shows higher risk to caesarian section which is in concordance with the study conducted by Padma S *et al.*,<sup>12</sup> found that increased incidence of LSCS are reported in patients with oligohydramnios. In order to improve maternal and fetal outcome c- section were highly preferred. The study conducted by Moses *et al.*,<sup>4</sup> in the year 2016 and Padma S *et al.*,<sup>12</sup> in the year 2017 found that increased incidence of LSCS was due to oligohydramnios followed by fetal distress which is comparable with our study. The study conducted by Mathuriya G *et al.*,<sup>2</sup> in the year 2017 and Chaitra *et al.*,<sup>10</sup> in the year 2016 found that fetal outcome was good in babies score  $\geq 7$  which is similar to our study. In our study, the maximum babies were alive and healthy. However, the admission of neonatal care due to respiratory distress syndrome was

present which is comparable with the study conducted by Ghimire S<sup>14</sup> in the year 2014.

## LIMITATION

The sample size was small. The multiple site study will be more helpful to find out more prevalence as our study was conducted at a single site.

## CONCLUSION

Oligohydramnios is frequent during the pregnancy. It is detected by ultrasonography with AFI range below or equal to 5cm detected before 37 weeks indicates good perinatal outcome. From this study, we conclude that patients in primigravida are more prone to oligohydramnios with associated factors such as GDM and anemia. In the third trimester, the complications resulting in the caesarian section was high in order to improve the fetal outcome. So timely screening for AFI between intrapartum and postpartum pregnancy, proper antenatal checkup and lifestyle changes in patients help to reduce maternal risk factors and improve the fetal outcome.

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## AUTHORS CONTRIBUTION STATEMENT

Ms. Sathyapriya K and Ms. Sonal Anto conceptualized and gathered the data with regard to this work. Dr.N.Venkateswaramurthy analyzed these data and necessary inputs were given towards the designing of the manuscript. All authors discussed the methodology and the result and contributed to the final manuscript.

## CONFLICT OF INTEREST

Conflict of interest declared none.

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