



## To Study The Feto-Maternal Outcomes In Pregnancies With Abnormal Liquor Volume.

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Date of Submission: 25-06-2023

Date of Acceptance: 08-07-2023

### ABSTRACT

#### MATERIALS AND METHODS

This cross sectional descriptive study was conducted in the Labour room of Sri AvittomThirunal hospital, Trivandrum for 6 months after obtaining institutional ethical committee clearance. In this study, pregnant women with singleton, gestational age between 28-42 weeks with abnormal liquor volume (AFI</-5 and AFI>/-25) were taken as study population. They were subjected to detailed history taking, clinical examination and ultrasound examination with doppler and by procuring relevant data from the case sheets, their feto-maternal outcome were studied.

#### RESULTS

Most of the women with abnormal liquor volume were presented at term. Isolated oligohydramnios (36%) was the most common cause followed by postdated pregnancy (28.3%) in oligohydramnios group. Incidence of congenital anomalies were high in polyhydramnios (22%) than in oligohydramnios (20%). Incidence of induction of labour (64.7%), cesarian section (63.3%), fetal distress (49%), meconium stained liquor (55.7%), low 5 minutes APGAR (55%), low birth weight (52.3%), IUGR /SGA (62.7%) and NICU admissions (44.7%) were common in oligohydramnios group.

Idiopathic polyhydramnios (58%) were the first common cause of polyhydramnios, the second were congenital anomalies (22%). Incidence of PROM (20%), preterm labour (14%), cord prolapse (6%), atonic PPH (4%), retained placenta (2%) were common in polyhydramnios group. Perinatal mortality (28%) were high in polyhydramnios group.

#### CONCLUSION

Isolated oligohydramnios and polyhydramnios in term gestation has better fetomaternal outcome compared to early onset and with associated conditions like hypertensive diseases of pregnancy, GDM, IUGR. A detailed history, clinical examination and relevant investigations should be

done to identify the various etiological factors in all cases of abnormal liquor volume, to get better fetal outcomes as well as to avoid the maternal complications.

**KEYWORDS:** Pregnancy, Oligohydramnios, Polyhydramnios, Congenital anomalies, Perinatal outcome

### I. INTRODUCTION

The amniotic fluid helps to shape the fetal skeleton normally by creating the physical space, promotes fetal lung maturation and protects the umbilical cord from the compression during labour. In 1950, Prof. Sir. Ian Donald<sup>1</sup> was the first to demonstrate and document the application of ultrasound to medical diagnosis. Various ultrasound methods have been proposed for the detection of amniotic fluid, among which the amniotic fluid index (AFI) is the most widely used method. J.P. Phelan<sup>2</sup> and colleagues in 1987 proposed this method.

Oligohydramnios is recently defined as AFI below 5th percentile for the gestational age. Postdated pregnancy, uteroplacental insufficiency, congenital anomalies especially renal abnormalities, meconium passage, fetal heart rate abnormalities, low 5 minute APGAR and increased NICU admission are associated with oligohydramnios.<sup>3</sup>

Polyhydramnios is defined as AFI > 95th percentile for gestational age. More than fifty percent of women with polyhydramnios, the etiology is unknown. Congenital fetal anomalies accounts for 20%, among which anencephaly occurs in 50% of the cases. Gestational diabetes, congenital infections also leads to the development of polyhydramnios.

So amniotic fluid volume assessment is a useful method to identify the fetus at risk for adverse obstetric and perinatal outcome. Therefore the present study is conducted to find out the perinatal and maternal outcome and to identify the possible causes of abnormal liquor volume.



**II. AIMS AND OBJECTIVES**

To study the fetomaternal outcome in pregnancies with abnormal liquor volume, who are managed in the labour room of department of obstetrics and gynaecology, Sri AvittomThirunal hospital, Trivandrum.

**III. MATERIALS AND METHODS**

It is cross sectional descriptive study conducted on pregnant women with singleton, gestational age between 28-42 weeks with abnormal liquor volume who are managed in the labour room SAT Hospital Trivandrum for a period of 6 months after obtaining the institutional ethical committee clearance. Singleton pregnancy, ultrasound finding of AFI  $\leq$  5cm &/or  $\geq$  25cm, gestational age of 28-42 weeks, with intact membrane were included in the study. Intrauterine fetal demise, premature rupture of membrane {PROM} and preterm premature rupture of membrane {PPROM}, multifetal gestation, those

who are not willing to take part/does not give consent for the study were excluded. As per the reference study, the sample size was calculated to be 384 and rounded to 400.

Informed consent in their local language will be obtained from each patient of the study population. The study population will be subjected to a detailed history taking, followed by complete physical examination. Obstetrical Ultrasound with Doppler will be done for the study population using a real time scanner with 3.5-5MHz transducer by the same person to avoid the inter observer variation. Fetal presentation, gestational age, liquor status, placental localization, and anomalies if present will be noted. Women with AFI of  $\geq$  25 or  $\leq$  5 will be considered as abnormal liquor volume. Data will be entered in excel sheet and analysed using SPSS software version 27. Qualitative variables will be expressed in proportion and quantitative variables will be expressed in mean and standard deviation

**IV. RESULTS AND ANALYSIS**

Age in years	Oligo		PPoly		Total	
	N	%	N	%	N	%
$\leq$ 20	24	8	10	10	34	8.5
21-30	214	71.3	69	69	283	70.8
$>$ 30	62	20.7	21	21	83	20.8
Total	300	100	100	100	400	100

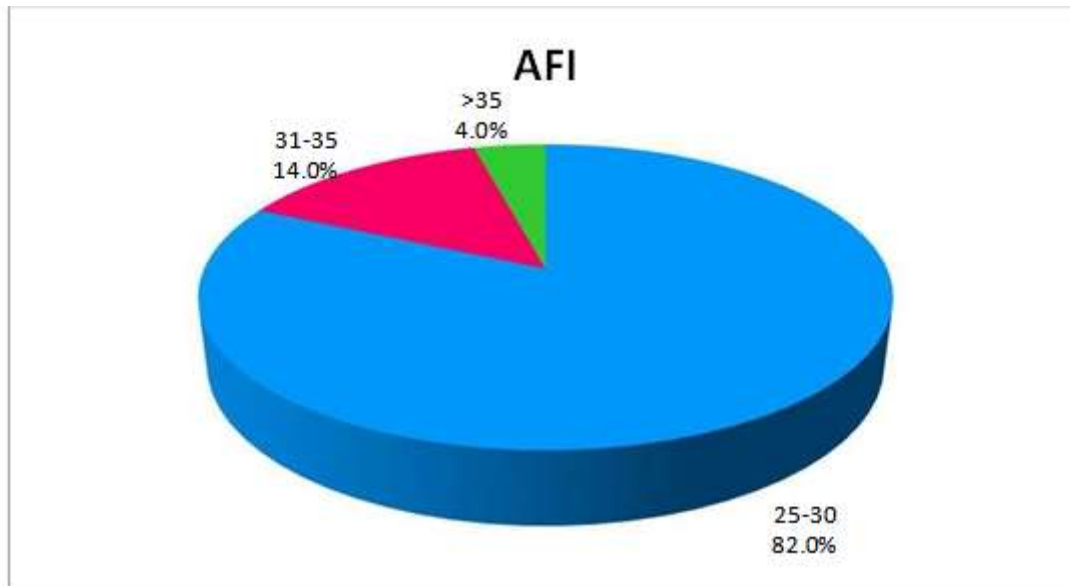
Among the 300 patients diagnosed to have oligohydramnios, 214 (71.3%) patients were found to be between 21 and 30 years while among the 100 patients with polydramnios, 69 (69%) patients were found to be between the age of 21 and 30 years. However it is to be noted that only 62 (20.7%) and 21 (21%) patients were over the age in 30 in both oligohydramnios and polyhydramnios groups respectively.

The number of primi gravid diagnosed with oligohydramnios was 210 (70%) out of the 300 patients studied, while it was 32 (32%) out of the 100 patients with polyhydramnios. It is to be noted that the maximum number of patients in this study who were diagnosed with polyhydramnios

had parity between G2-G3, that is, 56 out of the 100 patients (56%). None of the patients with a parity of G4-G5 had oligohydramnios while 12 (12%) had polyhydramnios.

Around 114 (38%) out of the 300 patients and 28 (28%) of the 100 patients had a gestational age of over 40 weeks in both oligohydramnios and polyhydramnios groups respectively. While the least number of patients were reported between 37 to 39 weeks of gestation in both the groups.

In polyhydramnios group, 82% of the patients had a mild polyhydramnios, 14 % patients had a moderate polyhydramnios and just 4 % patients had a severe polyhydraminous.



ASSOCIATED MATERNAL CONDITIONS	Oligo		Poly		Total	
	N	%	N	%	N	%
NIL	237	79	70	70	307	76.8
ANEMIA	8	2.7	0	0	8	2
APLA	4	1.3	0	0	4	1
CHORIOANGIOMA	0	0	2	2	2	0.5
GDM	0	0	16	16	16	4
GHT	8	2.7	4	4	12	3
PE	43	14.3	6	6	49	12.3
RH NEGATIVE	0	0	2	2	2	0.5
Total	300	100	100	100	400	100

There were no associated maternal conditions in 237(79%) patients and 70 (70%) patients from both the groups. The maximum associated maternal condition in oligohydramnios group was pre-eclampsia (14.3%) followed by gestational hypertension and anemia at 2.7% each and APLA at 1.3%. while in polyhydramnios group, the maximum number of reported maternal conditions were that of gestational diabetes mellitus(16%) followed by pre- eclampsia (6%) and gestational hypertension (4%). There were 2 cases each of polyhydramnios associated with choriangioma and rh negativity. Idiopathic factors were by large the most prevalent etiology for both oligohydramnios (36%) and polyhydramnios (58%)

groups. Postdated pregnancy (28.3%) was the major cause for oligohydramnios while gestational diabetes mellitus (16%) was the major cause of polyhydramnios in our study. Most of the labours in oligohydramnios group were induced (64.7%), while in polyhydramnios group; the labours were mostly spontaneous (80%). Caesarean section was the most common mode of delivery in oligohydramnios group (63.3%) and per vaginal delivery was the most common mode of delivery in polyhydramnios group (72%). Fetal distress was the prime cause for caesarean section in the oligohydramnios group (49%) while CPD was the major reason for cesarean section in polyhydramnios group (6%). 55.7% of patients had



meconium stained liquor in oligohydramnios group and only 12% of polyhydramnios patients had the same. None of the patients in oligohydramnios group had any labour complications in our study. In polyhydramnios group, complications such as premature rupture of membranes (20%), pre-term

labour (14%) cord prolapsed (6%), atonic post-partum haemorrhage (4%) and retained placenta (2%) were reported in our study. The perinatal deaths in oligohydramnios were at 7.3% while in polyhydramnios it remained at 28%.

APGAR AT 5 MINTS	OLIGO		PPOLY		Total	
	N	%	N	%	N	%
<7	165	55	22	22	187	46.8
>7	135	45	56	56	191	47.8

APGAR score at 5 minutes is an effective predictor of neonatal wellbeing. A score less than 7 is associated with poor outcomes. In our study 55 % of patients with oligohydramnios had an APGAR score of less than 7 at 5 minutes while it was 22% for polyhydramnios patients. However, this difference is not statistically significant. 52.3% of patients had a birth weight of less than 2.5 kgs in oligohydramnios group while it was at 12 % in polyhydramnios group. In oligohydramnios patients, 62.7% had IUGR while on 7% had IUGR in polyhydramnios group. 55.3% patients in oligohydramnios group required NICU admission while only 28% in polyhydramnios group required NICU admission.

**V. DISCUSSION**

In our study, 71.3% were in the age of 20-25 yrs in oligohydramnios group, 69% were in the age of 26-30 yrs in polyhydramnios group. This is comparable to Guin et al<sup>3</sup> study in 2011. Among the parity distribution, 70% of the cases in oligohydramnios group were primigravida, but there was no significant relation of age and parity with oligohydramnios according to the study done by Casey et al<sup>7</sup>, Chauhan et al<sup>8</sup>, Magann et al<sup>5</sup>. In polyhydramnios group majority of the women were multigravida which is comparable to study by Guin et al<sup>3</sup>.

**Maternal conditions associated with abnormal liquor volume:**

**Oligohydramnios:**

In our study, 38% were postdated pregnancy as compared to 10.7% in Guin et al<sup>3</sup> study. Anaemia was present in 2.7% of cases. APLA were present in 1.3%. However, the major

associated maternal condition was pre eclampsia (14.7%).

**Polyhydramnios:**

In our study, GDM were present in 16% as compared to Guin et al<sup>4</sup> study where 20% cases were GDM and 5% cases were GDM in Vaid et al<sup>11</sup> study. 12% cases were hypertensive diseases as compared to 17.7% in Guin et al<sup>4</sup> study and 13% in Vaid et al<sup>11</sup> study. 2% cases were Rh negative pregnancy as compared to Guin et al<sup>3</sup> where Rh -ve pregnancy were 4.4%, 1% in Lyndon M Hill et al<sup>12</sup> study.

**Congenital anomalies in abnormal liquor volume:**

**Oligohydramnios**

In our study, total of 20% cases had congenital anomalies as compared to 12.9% in Guin et al<sup>3</sup> study, 5.8% in Anil Shetty et al<sup>13</sup>. Infantile PCKD were 2% as compared to Guin et al<sup>3</sup> study where 7.5% were PCKD.

**Polyhydramnios.**

In our study, total of 22% had congenital anomalies which was comparable to Guin et al<sup>4</sup> study where 31.1% were associated with congenital anomalies. Anencephaly was the common anomaly that account for 8% as compared to 6% in Guin et al<sup>3</sup> study and 65.96% in Vaid et al<sup>11</sup> study. Spina bifida were present in 4% cases in our study as compared to 4% in Guin et al<sup>3</sup> study. Hydrocephalus with meningocele were in 4% cases in our study as compared to Guin et al<sup>3</sup> study where 10% cases were hydrocephalus, 10.63% in Vaid et al<sup>11</sup> study. Diaphragmatic hernia were present in 2% in our study, Duodenal atresia were 2% in our study as compared 4% in Guin et al<sup>3</sup> study. In our study, Non immune hydrops were



present in 2% cases as compared to 7% in Nicole Damato et al<sup>14</sup> study.

#### **Etiological factors in abnormal liquor volume:**

##### **Oligohydramnios**

In our study, 36% were isolated oligohydramnios with no identifiable cause as compared to 52% in Krishna jagatia et al<sup>15</sup>. 28.3% were postdated pregnancy as compared to 10.7% in Guin et al<sup>3</sup> study. 2.7% were hypertensive disease of pregnancy as compared to 38.46% in Chandra et al<sup>9</sup> study, 3.5% in Guin et al<sup>4</sup> study. 14% cases were IUGR which was comparable with Guin et al<sup>3</sup> study of 14.2% and 25% in Anil Shetty et al<sup>13</sup> study. 3.3% cases were congenital anomalies as compared to 12.9% in Guin et al<sup>3</sup> study, 5.8% in Anil Shetty et al<sup>13</sup> study.

##### **Polyhydramnios:**

In our study, exact cause of polyhydramnios was not detected in 58%. Total of 10% had congenital anomalies while in a study by Guin et al<sup>3</sup>, 31.1% were associated with congenital anomalies. 16% had GDM in our study which was comparable to 20% in Guin et al<sup>3</sup> study. 2% had Rh iso immunisation as compared to 4.4% in Guin et al<sup>3</sup> study, 1% in Lyndon M Hill et al<sup>12</sup>.

##### **Severity of polyhydramnios:**

In our study, 82%, 14%, 4% patients were mild, moderate and severe polyhydramnios respectively, which was comparable to Lyndon M. Hill et al<sup>12</sup> where 77.4%, 18.6%, 4% were mild, moderate and severe polyhydramnios respectively. Majority of mild polyhydramnios were detected at term in our study. In our study, induction rate was higher in oligohydramnios group of about 64.7% as compared to Guin et al<sup>3</sup> where 56.5% cases were induced. In polyhydramnios group only 20% cases were induced as compared to 13.6% in Guin et al<sup>3</sup> study. The rate of cesarean section was 63.3% in oligohydramnios group which is comparable to 42.8% in Guin et al<sup>3</sup> study and 76.92% in Chandra P et al<sup>9</sup> study. This increased rate of cesarean was due to fetal distress. In our study 49% cases had fetal distress which in turn due to increased meconium stained liquor (55.7%) and IUGR (14%). In our study, 55% of babies had low 5 minute APGAR score in oligohydramnios group as compared to 23.7% in Chandra et al<sup>9</sup>. In polyhydramnios group only 18% underwent cesarean section as compared to 22.2% in Guin et al<sup>3</sup>. Instrumental delivery rate was not significant in both oligo and polyhydramnios group in our study. In our study, with polyhydramnios group, 20% cases were PROM as compared to 44.5% in Guin

et al<sup>3</sup>, 14% were preterm labour which was comparable to 40% in Guin et al<sup>3</sup>, 6% had cord prolapse as compared to 4.4% in Guin et al<sup>3</sup> study. In our study, atonic PPH occurred in 4 % of cases as compared to 4.4% in Guin et al<sup>3</sup> study. Retained placenta was seen in 2% cases in our study. In our study, polyhydramnios group had high perinatal mortality rate of 28% as compared to oligohydramnios group which is 7.3%. This was comparable with Guin et al<sup>3</sup> study where perinatal mortality were 42.25% in polyhydramnios and 12.9% in oligohydramnios group. This high perinatal mortality in polyhydramnios group was due to increased fatal congenital anomalies.

In our study, with oligohydramnios group, 52.3% were  $\leq 2.5$  kg as compared to Chandra et al<sup>9</sup>, 45.99% were between 2.6-4 kg, No babies were born above 4 kg in contrast, polyhydramnios group delivered 66% babies with birth weight over 2.5 kgs and 12 % with  $\leq 2.5$  kgs in our study.

In our study, 55.3% babies were admitted in NICU in oligohydramnios group which is comparable to 46.15% in Chandra et al<sup>9</sup>. In polyhydramnios group 28% of babies were admitted in NICU.

## **VI. CONCLUSION**

- Development of abnormal liquor volume during pregnancy signals danger to the foetus. It is associated with an increased incidence of caesarean section, labour complications and adverse perinatal outcome.
- Isolated oligo and polyhydramnios in term gestation has better perinatal outcome compared to early onset and with associated conditions like hypertensive diseases of pregnancy, GDM, IUGR.
- Ultrasound is the ideal method to detect any abnormality in liquor volume. If any abnormality in liquor volume is detected during the ultrasound, a careful search should be made to detect any identifiable congenital anomalies.
- A detailed history, clinical examination and relevant investigations should be done to identify the various etiological factors in all cases of abnormal liquor volume, to get better foetal outcome as well as to avoid the maternal complications.
- It is evident from our study that abnormal liquor volumes have confirmed negative implications on the fetomaternal outcomes and a periodic pre natal screening is a must for all the pregnant women to curtail its devastating effects.



**Conflict of interest:**

This study is not sponsored and there are no conflict of interests.

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