



# **A Prospective Observational Study on Causes and Effectiveness of Oligohydramnios Treatment in Pregnant Women with Different Comorbidities**

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#### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

#### **Article Information**

DOI: 10.9734/IJTDH/2023/v44i181475

**Open Peer Review History:**  
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here:  
<https://www.sdiarticle5.com/review-history/106136>

**Original Research Article**

**Received: 17/07/2023**

**Accepted: 21/09/2023**

**Published: 28/09/2023**

## **ABSTRACT**

Oligohydramnios is a rare condition characterised by decreased amniotic fluid volume for gestational age. To determine the causes and effectiveness of oligohydramnios treatment in oligohydramnios pregnant women. We conducted a prospective and observational study at GMH (Government Maternity Hospital) in Hanamkonda over a period of 6 months. We included 203 oligo patients in this study and in which patients were grouped as 3 categories based on amniotic fluid index (AFI) as mild, moderate, severe. Information of the patients were collected from patient case reports and face to face interactions. The data was analysed through EXCEL. From our study we

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can conclude that oligohydramnios treatment is showing improvement in mild, moderate and severe oligohydramnios patients. But patients with uncontrolled hypertension were not showing liquor improvement because of their decreased placental perfusion. Gestational diabetes and thyroid do not cause oligohydramnios in pregnancy condition.

**Keywords:** *Oligohydramnios; amniotic fluid index (AFI); pregnancy – induced hypertension (PIH); primary rupture of membranes (PROM); gestational diabetes mellitus (GDM).*

## 1. INTRODUCTION

Oligohydramnios is a rare condition characterised by decreased amniotic fluid volume for gestational age which results in foetal or placental complications leading to poor foetal outcomes. The amount of amniotic fluid varies during the course of pregnancy. The clinical evaluation of AFV utilizes fundal height measures and ultrasound analysis during pregnancy. [1]

Normal amniotic fluid range is 14 – 18 cm is most common after 30 weeks. Mild oligohydramnios ranges from 8-9 cm, Moderate oligohydramnios ranges from 6-7cm and severe oligohydramnios range is less than 6 cm.

The main function of amniotic fluid is to protect the fetus from mechanical injury, it permits movement of the fetus while preventing limb contracture, it helps to develop lungs, and it prevents pressure on the umbilical cord [2-4].

## 2. CAUSES [1,5]

**Maternal causes include:** Maternal dehydration, Hypertension or pre-eclampsia, Uteroplacental insufficiency, Chronic hypoxia, Gestational diabetes.

**Drug-induced causes include:** Angiotensin-converting enzyme inhibitors, Nonsteroidal anti-inflammatory drugs.

**Placental causes include:** Twin-to-twin transfusion syndrome, Abruptio.

**Foetal causes include:** Premature rupture of membrane, Chromosomal abnormalities, Genitourinary abnormalities – renal agenesis, Obstructive nephropathy, foetal growth restriction.

**Idiopathic:** The majority of oligohydramnios cases diagnosed in the third trimester are of unexplained ethiology.

## 2.1 COMPLICATIONS [6]

Intrauterine uterine growth restriction, Foetal death, Contracted limbs (if oligohydramnios begins early in Pregnancy), Incomplete or delayed lung development (if oligohydramnios begins early in the pregnancy), Due to the foetus' inability to tolerate labour, a caesarean delivery is required.

## 2.2 Pathophysiology [7]

The amniotic fluid volume rises steadily until 33 weeks of pregnancy. The amniotic fluid level peaks between weeks 33 and 38, then begin to fall; at term, it is about 500 ml. The placenta and some foetal secretions make up a minor portion of it, foetal urine production makes up the majority (e.g., respiratory). The developing foetus breathes and ingests amniotic fluid. It is processed, the bladder is filled, it is emptied, and the cycle is repeated. In this pathway, issues with any of the structures might result in either too much or not enough fluid.

## 2.3 Treatment Given to Patients

L-arginine sachets [8,9,2], Fructodex [10], Alamin nutritional supplement [10], Astymin forte capsule, Argihope syrup.

## 2.4 Need for the Study

The study was done to assess the causes and amniotic fluid index improvement in oligohydramnios condition in pregnancy conditions and to monitor the oligohydramnios treatment effectiveness in mild, moderate, and severe conditions with comorbidities in pregnant women.

## 2.5 Aim

To determine the causes and effectiveness of oligohydramnios treatment in oligohydramnios pregnant women.

## 2.6 Objectives

- To assess the cause of oligohydramnios in pregnancy.
- To assess the complications of oligohydramnios.
- To assess the effectiveness of oligohydramnios treatment.
- To assess the improvement of amniotic fluid after the treatment.

## 3. METHODOLOGY

### 3.1 Materials and Methods

It is a prospective and observational study designed to assess the causes, complications and effectiveness of oligohydramnios treatment in pregnant women with different comorbidities. The study was conducted at Government maternity hospital (GMH) in Hanamkonda. This study was conducted over a period of 6 months from October 2022 to march 2023 on 202 patients.

The subject selection of age group 16 – 35 years pregnant women with oligohydramnios, gestational age above 30 weeks, oligohydramnios patients with GDM, PIH, Hypothyroidism, PROM, Low water intake and diarrhoea were included. Subjects with Non-

pregnant women, Pregnant women with IVF, IUI and Induction were excluded.

Data was collected using data collection form includes information on socio-demographic details (name, age, occupation), complications during pregnancy, marital life, scans and management. The data was analysed through EXCEL.

## 4. RESULTS

Fig. 1 graph shows oligohydramnios is divided into mild 30(14.7 %), moderate 91 (44.8%) members and severe 82 (40.5%) members.

Fig. 2 graph shows the number of outpatients were 121(59.6 %) members and the inpatients were 82 (40.4%) member.

Fig. 3 graph shows the number of patients with Gestational diabetes is 32(15.7%) members, pregnancy-induced hypertension is 55(27%) members, Hypothyroidism is 36(17.7%) members, PROM are 24(11.8%) members, Low water intake is 48(23%) members and others (include diarrhoea) are 8(3.8%) members.

Based on this Fig. 4. graph, the number of total inpatients were 82, in which 60(73.2%) of patients were receiving medication, whereas 22(26.8%) of patients were on emergency LSCS.

Table 1. Types of oligohydramnios

Types of oligohydramnios	No. of patients	Percentage
Mild	30	14.7%
Moderate	91	44.8%
Severe	82	40.5%

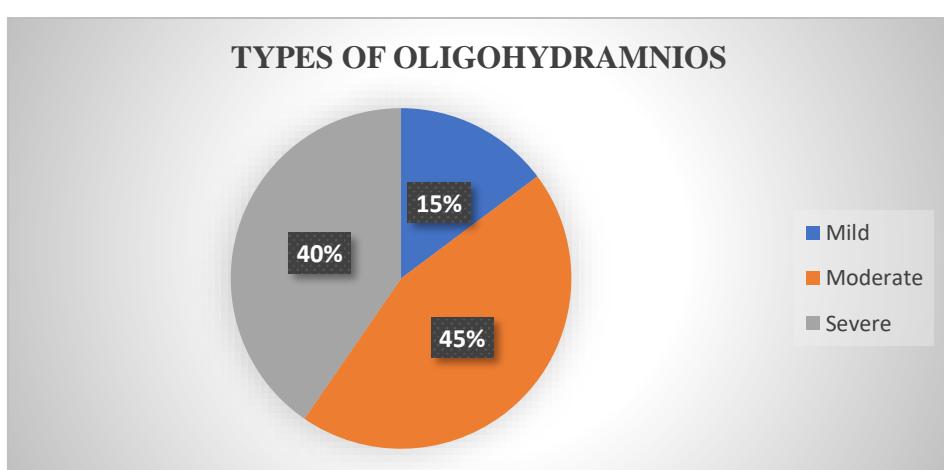
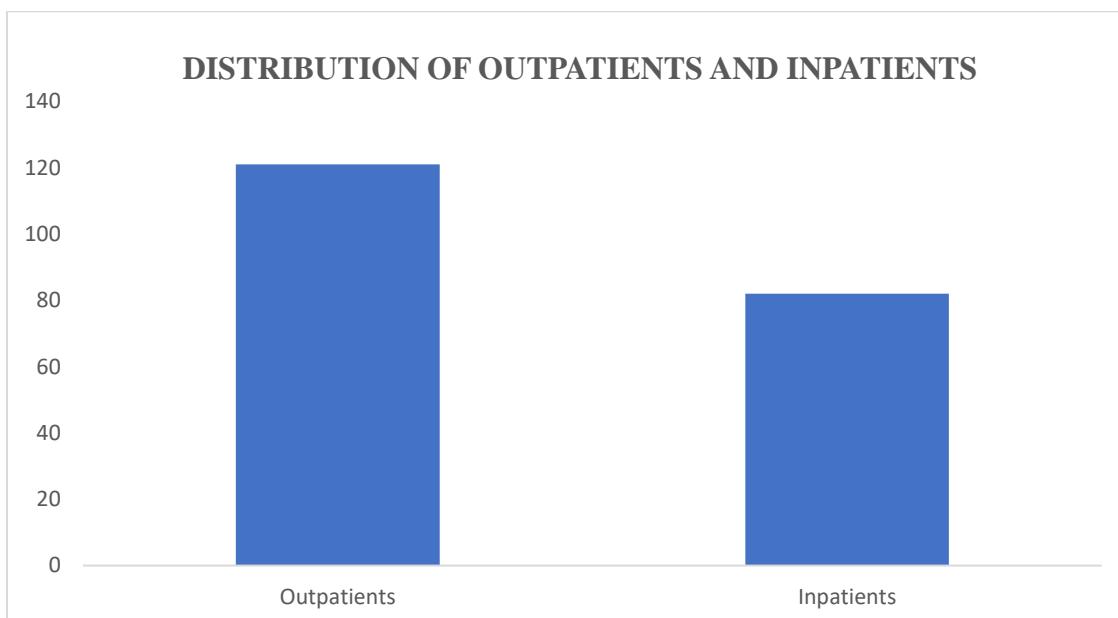


Fig. 1. Types of oligohydramnios chart

**Table 2. Distribution of inpatient and outpatients**

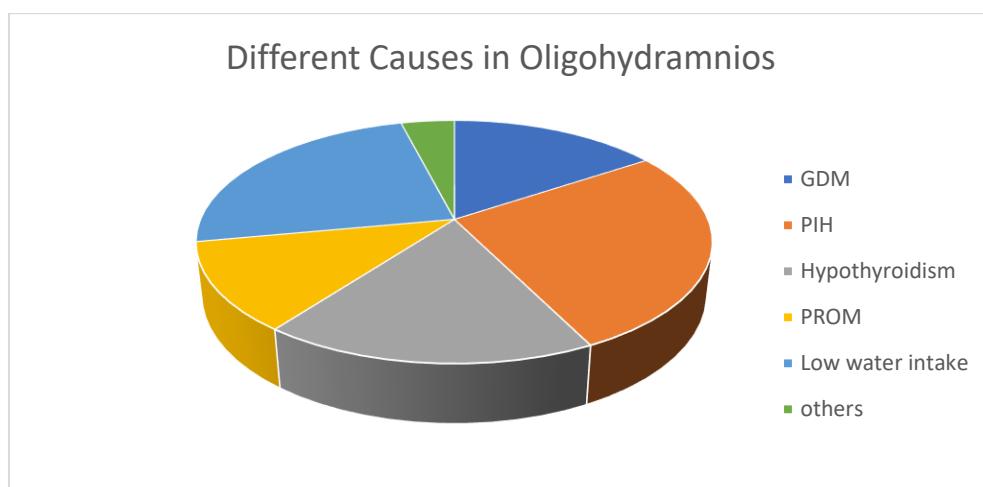
Patient distribution	No. of patients	Percentage
Outpatients	121	59.6%
Inpatients	82	40.4%



**Fig. 2. Distribution of outpatients and inpatients**

**Table 3. Causes of Oligohydramnios**

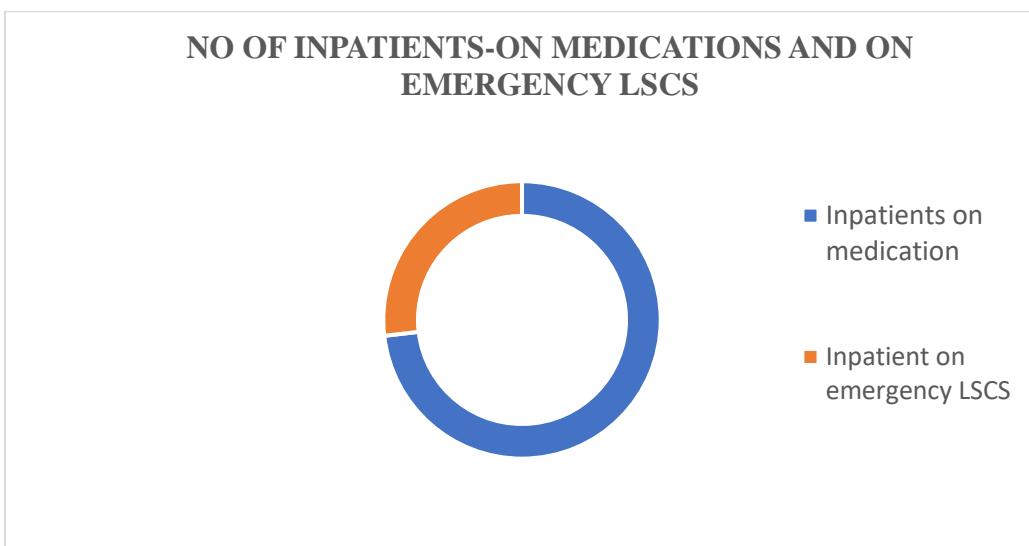
SNO	Causes	No. of patients	Percentage
1	GDM	32	15.7%
2	PIH	55	27%
3	Hypothyroidism	36	17.7%
4	PROM	24	11.8%
5	Low water intake	48	24%
6	others	8	3.8%



**Fig. 3. Causes of oligohydramnios**

**Table 4. Total no of inpatients on medication and on emergency LSCS**

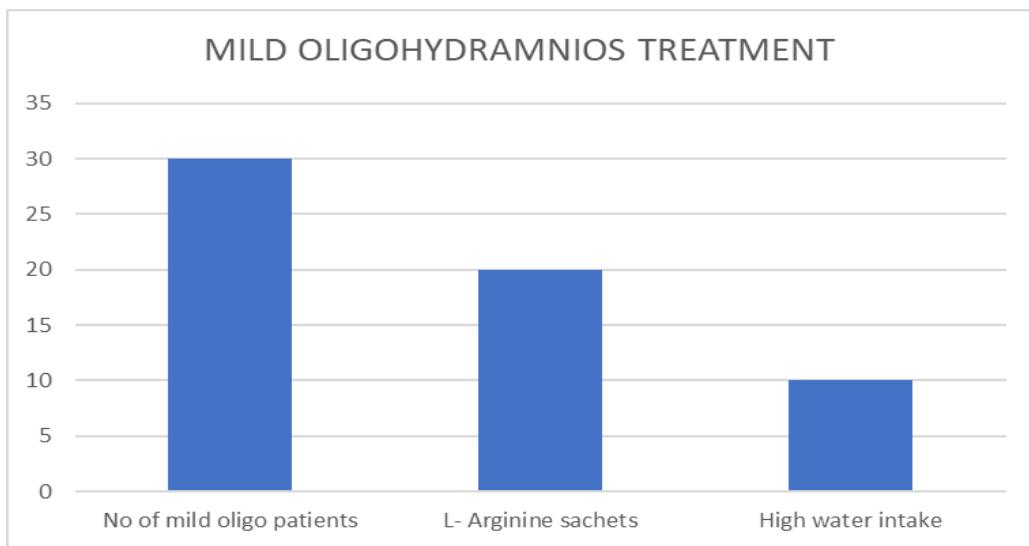
Total no of inpatients	Inpatients on medication	Inpatient on emergency LSCS
82	60 (73.2%)	22(26.8%)



**Fig. 4. No of inpatients -on medications and on emergency LSCS**

**Table 5. Mild Oligohydramnios treatment**

No of mild oligo patients	L- Arginine sachets	High water intake
30	20	10



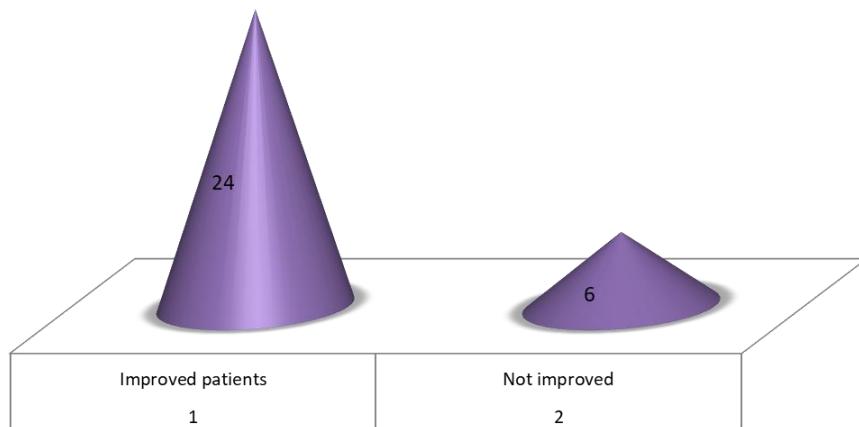
**Fig. 5. Mild oligohydramnios treatment chart**

- Above graph shows the number of patients with mild oligo (8-9 cm) in which 20 members were advised to take L-arginine sachets.
- And the number of patients with mild oligo (10-11cm) i.e. 10 members were advised to consume more water.

**Table 6. Total no of patients with mild oligohydramnios -improved and not improved**

SNO	Patient distribution	No of patients	Percentage
1	Improved patients	24	80%
2	Not improved	6	20%

#### MILD OLIGOHYDRAMNIOS-IMPROVED AND NOT IMPROVED

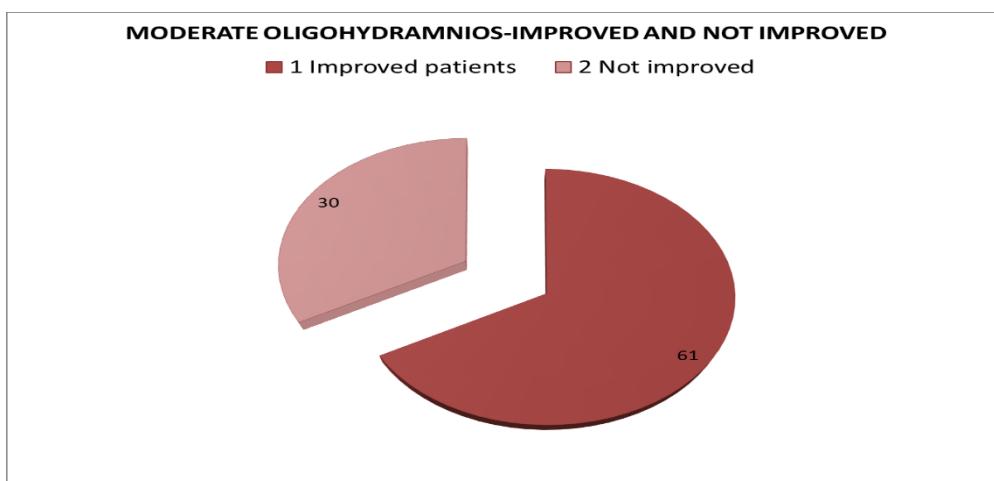


**Fig. 6. Mild–oligo: improved and not improved patients**

From the above Fig. 6 graph 80% (24 members) were improved from mild oligohydramnios whereas 20% (6 members) were not improved.

**Table 7. Total no of patients with moderate oligo-improved and not improved**

S.NO	Patient distribution	No of patients	Percentage
1	Improved	61	67%
2	Not improved	30	33%

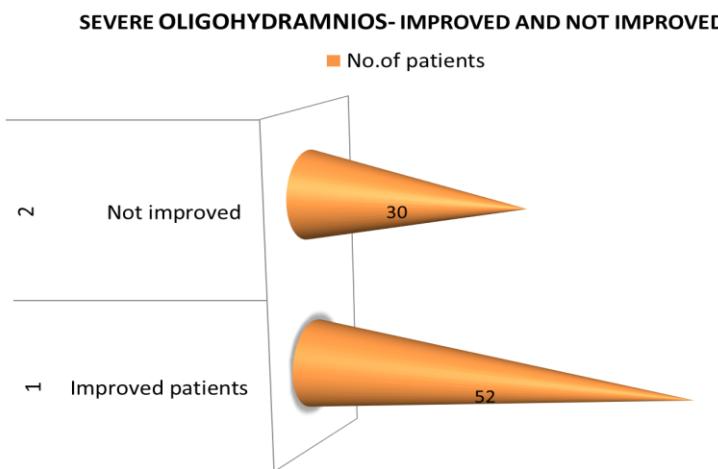


**Fig. 7. Moderate oligo-improved and not improved**

Above graph shows, the number of improved patients with moderate oligohydramnios were 61(67%) members and the number of not improved patients are 30(33%) members.

**Table 8. Total no of patients with severe oligo-improved and not improved**

SNO	Patient distribution	No of patients	Percentage
1	Improved patients	52	64%
2	Not improved	30	36%

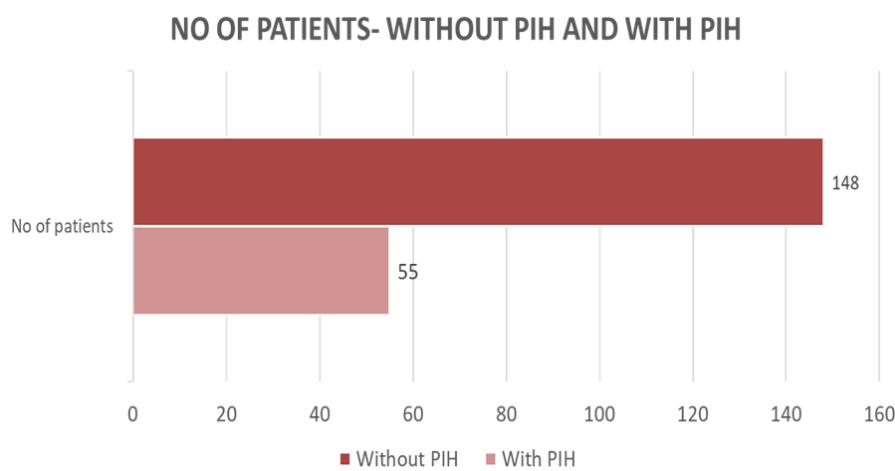


**Fig. 8. Severe oligohydramnios -improved and not improved**

Above Fig. 8. graph shows the number of improved patients in severe oligohydramnios is 52(64%) members, and the number of not improved patients in severe oligohydramnios is 30(36%) members.

**Table 9. Total no of patients with PIH and without PIH**

SNO	Patient distribution	No of patients	Percentage
1	With PIH	55	27%
2	Without PIH	148	73%

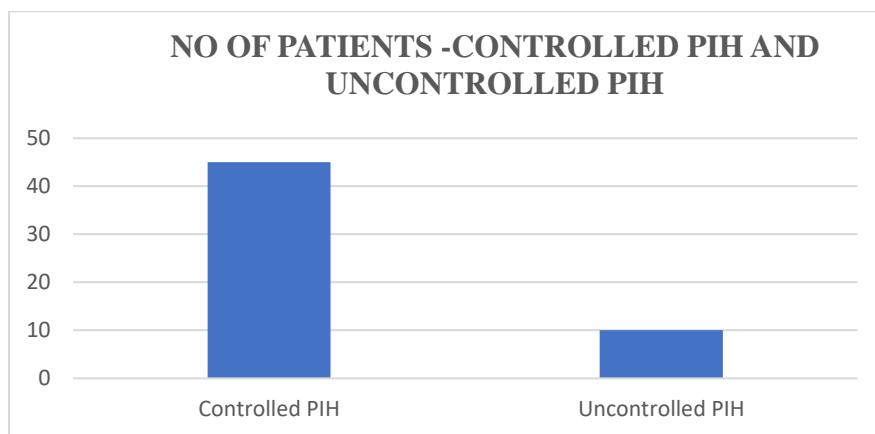


**Fig. 9. No of patients with PIH and without PIH**

Above Fig. 9 graph shows the number of patients with pregnancy induced hypertension are 55 (27 %) members, the number of patients without hypertension are 148 (73%) members.

**Table 10. Total no of patients with controlled PIH and uncontrolled PIH**

SNO	Patient distribution	No of patients	Percentage
1	Controlled PIH	45	81%
2	Uncontrolled PIH	10	19%

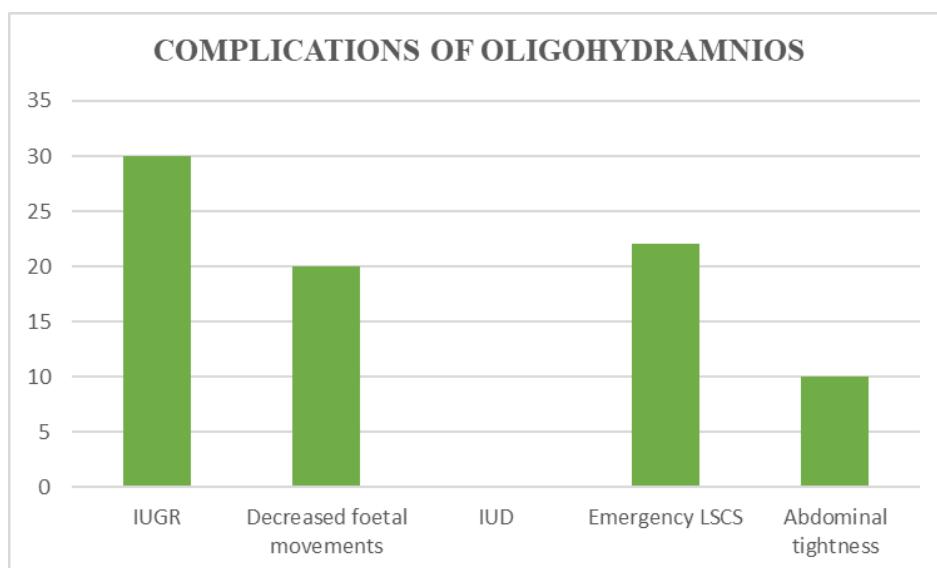


**Fig. 10. No of patients- controlled PIH and uncontrolled PIH**

Above Fig. 10 graph shows the number of patients with controlled hypertension were 45 (81%) members and uncontrolled hypertension were 10 (19%) members.

**Table 11. complications of oligohydramnios.**

Complications	IUGR	Decreased foetal movements	IUD	Emergency LSCS	Abdominal tightness
No of patients	30	20	0	22	10



**Fig. 11. Complications of oligohydramnios**

Above graph Fig. 11 shows the complications of oligohydramnios: IUGR-30 members, Decreased Fetal Movements-20members, IUD-0 members, Emergency LSCS -22 members, Abdominal tightness -10 members.

**Table 12. Oligohydramnios improvement duration monitoring**

<b>Severe oligo</b>	<b>Moderate oligo</b>	<b>Mild oligo</b>
3 days	1 week	10 days

**Table 13. Before liquor treatment and After liquor treatment**

<b>Types of Oligohydramnios</b>	<b>Liquor value before treatment</b>	<b>Liquor value after treatment</b>	<b>Duration</b>
Mild oligo	8 to 9 cm	11 to 12 cm	10 Days
Moderate oligo	7 to 8 cm	10 to 11 cm	1 Week
Severe oligo	2 to 4 cm	5 to 6 cm	3 Days

**Table 14. Types of PIH -before liquor treatment and after liquor treatment**

<b>Types of pih</b>	<b>Liquor value before treatment</b>	<b>Liquor value after treatment</b>
Controlled pih	2 to 3 cm	5 to 6 cm
Uncontrolled pih	2 to 3 cm	2 to 3 cm

After taking the treatment patients were analysed with a doppler scan in that severe oligo patients rechecked after three days, moderate oligo patients rechecked after one week and mild oligo patients rechecked after ten days.

## 5. DISCUSSION

In our recent research we examined 203 patients having oligohydramnios with different comorbidities. The data included in the study were oligohydramnios with PIH, GDM, PROM, Hypothyroidism, and diarrhoea.

From the data we collected 82 members were inpatients because of abdominal tightness, decreased foetal movements, absence of foetal movements, uncontrolled blood pressure and uncontrolled sugar patients. and 121 members were outpatients. Outpatients were on regular check-ups. Among them oligohydramnios with different comorbidities were PIH (27%), PROM (11.8%), Low water intake (24%) and diarrhoea (3.8%).

August 1993 study showed incidence of oligohydramnios ranges from 20 to 30 % in PIH patients. From our study we concluded PIH patients were 27%.

June 2023 study showed PROM, Hypertension and Gestational diabetes are the major causes of oligohydramnios. In our study we observed PIH and low water intake are the major causes for oligohydramnios.

Effectiveness of oligohydramnios treatment was analysed out of 203 population, 193 individuals

were improved. 10 members were not improved due to decreased placental perfusion.

## 6. CONCLUSION

The conclusion of the study is that oligohydramnios treatment is showing improvement in mild, moderate and severe oligohydramnios patients. But patients with uncontrolled hypertension were not showing liquor improvement because of their decreased placental perfusion. Gestational diabetes and thyroid do not cause oligohydramnios in pregnancy condition.

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

## ACKNOWLEDGEMENT

The author conveys my sincere regards and deep sense of gratitude to my respect guide for inspiring guidance, valuable suggestions. Words are not sufficient to express my deepest love and appreciation to my parents and my friends.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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