

## Original Research Article

# Oral versus intravenous maternal hydration in isolated third trimester oligohydramnios

Humaira Zafar<sup>1\*</sup>, Mubashra Naz<sup>1</sup>, Umber Fatima<sup>1</sup>, Uzma Shahzad<sup>2</sup>,  
Anees Fatima<sup>1</sup>, Attiya Yasmin<sup>1</sup>

<sup>1</sup>Department of Obstetrics and Gynaecology, University Medical and Dental College, <sup>2</sup>Department of Obstetrics and Gynaecology, Independent Medical College, Faisalabad, Pakistan

**Received:** 23 July 2020

**Accepted:** 20 August 2020

**\*Correspondence:**

Dr. Humaira Zafar,

E-mail: [humairazafar75@gmail.com](mailto:humairazafar75@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** To study the effect of oral and intravenous maternal hydration in patients with isolated oligohydramnios in terms of mean change in amniotic fluid.

**Methods:** A total number of 38 patients included in the study which fulfill the selection criteria. Patients were randomly divided in two groups. Amniotic fluid index (AFI) of all patients was measured before the hydration therapy according to the method of Phelan et al. In maternal oral hydration (Group A), every patient was instructed to drink two liters of water over two hours daily for 1 week. In intravenous hydration (Group B), every woman infused two liters of 0.9% normal saline in two hour daily for 1 week. After 48 hours and 1 week of oral and intravenous hydration, the AFI was reassessed by the same observer. Patients were monitored closely for sign and symptoms of fluid overload. Data was stratified for mean difference in improvement in amniotic fluid index.

**Results:** After oral hydration therapy AFI was  $5.926 \pm 0.4593$  after 48 hours and  $8.286 \pm 0.6000$  after 7 days in Group A. In Group B AFI was  $5.784 \pm 0.4622$  after 48 hours and  $7.868 \pm 0.2810$  after 7 days of intravenous hydration. P value after 48 hours is 0.348 and  $p=0.014$  after 7 days means oral hydration therapy significantly increase amniotic fluid index.

**Conclusions:** Oral maternal hydration significantly increase the amniotic fluid index in patients with isolated oligohydramnios. It is simple, safe and non-invasive method.

**Keywords:** Amniotic fluid index, Intravenous hydration, Isolated oligohydramnios, Oral hydration

### INTRODUCTION

An adequate amniotic fluid volume is necessary for intrauterine growth and fetal well-being. Oligohydramnios is defined as decreased amniotic fluid volume measured on ultrasound criteria which include  $AFI < 5$ cm. Oligohydramnios complicates 8.5% to 15.5% of pregnancies.<sup>1</sup>

There are multiple causes of oligohydramnios like rupture membranes, hypertension, fetal urinary tract abnormalities, drugs or can be identified without any cause described above when it is called isolated oligohydramnios.<sup>2</sup> Oligohydramnios is also observed in post term pregnancies and occurs in 12% pregnancies after 41 weeks of gestation.<sup>3</sup>

Oligohydramnios is invariably associated with increased rate of perinatal morbidity and mortality as a result of cord compression, fetal distress, pulmonary hypoplasia.<sup>4</sup>

Several treatment options have been suggested to improve the AFI like serial trans abdominal amino infusion, intra amniotic sealing techniques, Desmopressin use and fetal cystoscopy but all these modalities are costly, need hospitalization and associated with serious side effects. So maternal hydration is considered an effective and cheap intervention to treat oligohydramnios in resource poor setting like ours.<sup>5</sup>

Maternal hydration increases the amniotic fluid through reduction in maternal plasma osmolality which result in increased AFI. The mother’s fluid balance has great impact on amniotic fluid. Increased maternal fluid intake leads to increase in AFI with oligohydramnios.<sup>6</sup>

**METHODS**

The study was conducted in the department of Obstetrics and Gynecology Madina Teaching Hospital affiliated with University Medical and Dental College Faisalabad between July 2019 to December 2019.

**Sample selection**

*Inclusion criteria*

Inclusion criteria for the sample selection was AFI of <5 cm, 28-36 weeks of gestation, Intact membranes, Singleton pregnancy

*Exclusion criteria*

Exclusion criteria for the sample selection was maternal conditions (pre-eclampsia, cardiac disease, renal impairment, severe anemia), ruptured membranes, multiple pregnancy, congenital anomaly in fetus.

After taking approval from ethical committee, patients presenting in department of Obstetrics and Gynecology (OPD and indoor) which fulfill the inclusion and exclusion criteria were included in the study. Patients were equally distributed in two groups and remain admitted for the period of 1 week.

AFI of all patients was measured before the hydration therapy according to the method of Phelan et al which add the maximum vertical fluid pocket (devoid of cord and fetal parts) measured in 4 uterine quadrants.

In maternal oral hydration (Group A), every patient was instructed to drink two liters of water over two hours daily for 1 week. In intravenous hydration (Group B), every woman infused two liters of 0.9% normal saline in two hour daily for 1 week. After 48 hours and 1 week of oral and intravenous hydration, the AFI was reassessed

by the same observer. Patients were monitored closely for sign and symptoms of fluid overload.

Data was stratified for mean difference in improvement in amniotic fluid index

The data was entered in statistical package for social science (SPSS V-16) software program and analyzed.

**RESULTS**

A total number of 38 patients were enrolled in this study. Sampled population was randomly divided in two groups Each group contain 19 patients.

In all the patients included in the study, there was no vomiting and oral hydration well tolerated.

Age distribution shows that 68.42% (n=13) in group A and 57.89% (n=11) in Group B were between 18-30 years of age whereas 31.57% (n=6) in Group A and 42.10% (n=8) in Group B were between 31-38 years of age, mean±SD was calculated as 26.68±5.963 years in Group A and 28.79±5.760 years in Group B (Table 1).

**Table 1: Age distribution (n=19).**

Age (in years)	Group A		Group B	
	No. of patients	%	No. of patients	%
<b>18-30 Years</b>	13	68.42	11	57.89
<b>31-38 Years</b>	06	31.57	08	42.10
<b>Total</b>	19	100	19	100
<b>Mean±SD</b>	26.68±5.963		28.79±5.760	

**Table 2: Gestational Age.**

Gestation al age (in weeks)	Group A (n=19)		Group B (n=19)	
	No. of patients	%	No. of patients	%
<b>28-32 weeks</b>	07	36.84	09	47.36
<b>32-36 weeks</b>	12	63.15	10	52.63
<b>Total</b>	19	100	19	100
<b>Mean±SD</b>	33.79±2.692		32.37±2.813	

Regarding gestational age 36.84% (n=7) patients in Group A and 47% (n=9) in Group B were between 28-32 weeks of gestation whereas 63.15% (n=12) in Group A and 52.63% (n=10) in Group B were between 32-36 weeks of gestation. Mean age was 33.79±2.692 weeks in Group A and 32.37±2.813 weeks in Group B (Table 2).

Baseline mean AFI was  $3.316 \pm 0.8368$  in Group A before treatment and  $3.211 \pm 0.8178$  in Group B ( $p=0.697$ ). After oral hydration therapy AFI was  $5.926 \pm 0.4593$  after 48 hours and  $8.286 \pm 0.6000$  after 7 days in Group A.

**Table 3: Comparison of increase in mean AFI volume.**

	Group	n	Mean AFI	SD	P value
AFI at baseline	Oral	19	3.316	0.8368	0.697
	IV	19	3.211	0.8178	
AFI after 48 h	Oral	19	5.926	0.4593	0.348
	IV	19	5.784	0.4622	
AFI after 7 days	Oral	19	8.268	0.6000	0.014
	IV	19	7.868	0.2810	

## DISCUSSION

Amniotic fluid volume is a parameter that has significant role in evaluation of fetal wellbeing. It plays a major role in the development of fetus and allows development of musculoskeletal system. Adequate amniotic fluid is considered to be vital for fetus.<sup>7</sup> This study was conducted to determine the role of hydration therapy in isolated oligohydramnios and the results shows that oral hydration is more effective in increasing amniotic fluid index as compare to intravenous hydration.

In our study we concluded that there is significant increase in mean AFI volume after oral hydration. The results were comparable to a study conducted in Faisalabad Medical University, Faisalabad.<sup>5</sup>

Our findings were also agreed with study conducted in Egypt, they show the good effect of oral hydration over IV hydration.<sup>4</sup>

Gizzo et al observed that in isolated oligohydramnios maternal oral hydration is more effective than intravenous hydration.<sup>8</sup>

Although oral hydration is simple, inexpensive and non-invasive method but the compliance of the patient is very important factor. If well tolerated, will increase amniotic fluid volume and improve perinatal outcome.<sup>9</sup>

Momina et al conducted a study on 226 women and found that oral hydration is better as compare to intravenous maternal hydration.<sup>10</sup> The observations in our study were also supported by a randomized controlled trial that was conducted at institute of child and mother health, Dhaka.<sup>11</sup>

The results of our study are also comparable to another study conducted by AC Rossi in 2013.<sup>12</sup>

Kiran et al reported that both i.e. oral and intravenous hydration are effective in term of increase in amniotic fluid index.<sup>13</sup>

Oligohydramnios is one of the prevalent threatening condition to fetal health. It is commonly associated with intrauterine growth restriction, fetal distress increased operative delivery and meconium aspiration. Oral hydration therapy is safe and inexpensive treatment and should be offered to the women with isolated third trimester oligohydramnios.<sup>14</sup>

## CONCLUSION

Oral maternal hydration significantly increases the amniotic fluid index in patients with isolated oligohydramnios. It can be used instead of intravenous hydration because it is simple, safe and noninvasive method. It is also easily acceptable to the patients.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Patel A, Yadav K, Goswami G. All effects of oral and intravenous therapy on amniotic fluid index, maternal and perinatal outcome in isolated oligohydramnios. *Europ J Biomedic Pharmaceutic Scienc.* 2016;(3)6:316-21.
2. Ali H, Ahmed S. The effect of oral versus intravenous fluid therapy on maternal and neonatal outcomes for women with oligohydramnios. 2018;(15)3:228-35.
3. Bhat S, Kulkarni V. Study of effects of oligohydramnios on maternal and fetal outcome. *Int J Medic Develop Count.* 2015;4:582-8.
4. Nada Z. Oral and intravenous maternal hydration in third trimester idiopathic oligohydramnios: effects and duration. *J Nurs Heal Scien.* 2015;(4)5:22-5.
5. Zafar AF, Maqsood S, Niaz A, Noor S, Javed N. Comparison of Mean Amniotic Fluid Index in Maternal Oral Hydration Therapy with Routine Hydration in Third Trimester Oligohydramnios. *Anna Punja Medic Colle.* 2017;11(3):257-60.
6. Krishnaveni MA study of fetal outcome in oligohydramnios (AFI between 0-7). *J Eveide Base Med Healthc.* 2015;2(12):1801-11.
7. Asnafi N, Bouzari Z, Mohammadnetadj M. Oligohydramnios and pregnancy outcome: Ten-years review. *Int Biolog Biomedic J.* 2015;1(1):23-8.
8. Gizzo S, Noventa M, Vitagilano. An update on maternal hydration strategies for amniotic fluid improvement in isolated oligohydramnios and normohydramnios: Evidence from a systemic Review of Literature and Meta- Analysis. *PLoS One.* 2015;10(12):e0144334.
9. Patil N, Abhigna V. A randomized controlled trial to compare the efficacy of three different methods of maternal hydration for oligohydramnios. *J Krish Institu Medic Scienc Univer.* 2018;7(1).

10. Momina SB, Akhtar M, Akram M, Yasmeen S. Comparison of the effects of oral and intravenous maternal hydration in the management of third trimester oligohydramnios. *Biomedica.* 2012;28:126-9.
11. Akhtar MD, Kabir N, Shah MS, Islam F, Tasnim. Effects of maternal oral hydration therapy in oligohydramnios. *Mymenish Med J.* 2012;21:723-8.
12. Rossi AC, Prefumo F. Perinatal outcome of isolated oligohydramnios at term and post term pregnancy: a systematic review of literature with meta – analysis. *Eur J Obstet Gynecol Biol.* 2013;169(2):149-54.
13. Kiran S, Ameen A, Akram A, Jamil M. Comparison of effects of oral maternal hydration and intravenous infusion on Amniotic Fluid index in third trimester isolated oigohydramnios. *Professional Med J.* 2019; 26(12):2064-9.
14. Chauhan NS, Namdeo P, Modi JN. Evidence based management of oligohydramnios. *J Gynecol.* 2018; 3(3)000160.

**Cite this article as:** Zafar H, Naz M, Fatima U, Shahzad U, Fatima A, Yasmin A. Oral versus intravenous maternal hydration in isolated third trimester oligohydramnios. *Int J Res Med Sci* 2020;8:3449-52.