

To Compare the Mean Amniotic Fluid Index with Oral Versus Intravenous Maternal Hydration for Management of Females Presenting with Oligohydramnios in Third Trimester of Pregnancy

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ABSTRACT

Objective: To compare the mean amniotic fluid index with oral versus intravenous maternal hydration for management of females presenting with oligohydramnios in third trimester of pregnancy

Study Design: Randomized controlled trial study.

Place and Duration of Study: This study was conducted at Idris Teaching hospital Sialkot Medical College Sialkot from Jan 2017 to Jan 2018.

Materials and Methods: 200 patients were included in this study, the performa was designed to record the demographic data and lab tests advised and also ultrasound of abdomen of every patients was conducted. The written informed consent was taken from every patient before the start of the study. The permission of Ethical Committee was considered before start of the sampling and publishing in medical forum journal. The Data was analyzed for results on SPSS version 10.

Results: In our study the mean age of the patients was 28.68 ± 6.85 years and the mean gestational age of the patients was 32.95 ± 3.18 weeks. The mean value of pre-treatment AFI of the patients was 4.07 ± 0.36 cm and the mean value of post-treatment AFI of the patients was 4.09 ± 0.37 cm. Statistically there is insignificant difference was found between the post-treatment AFI values with study group i.e. $p\text{-value} > 0.05$.

Conclusion: It has been proved in our study that there is insignificant difference between oral and intravenous hydration for management of females presenting with oligohydramnios in third trimester of pregnancy.

Key Words: Third trimester, Amniotic Fluid Index, AFI, Oral route, Intravenous route,

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INTRODUCTION

Amniotic fluid serves to protect the fetus and umbilical cord from compression, has antibacterial properties, and serves as a reservoir of water and nutrients. Early in gestation it is derived from mother and fetus, later its main source is fetus (fetal urine and lung fluid). Oligohydramnios is defined as amniotic fluid index (AFI) of less than 5cm.¹

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Oligohydramnios may be responsible for malpresentation problems, umbilical cord compression, concentration of meconium in the liquor, and difficult or failed external cephalic version. Simple maternal hydration appears to increase amniotic fluid volume (AFV)². Maternal intravenous as well as oral hydration increases AFV in women with oligohydramnios but neither appears to be advantageous over the other to increase AFV³. Maternal hydration with hypotonic solution (water) causes osmotic changes, which relates to parallel decrease in foetal osmolarity, increase in fetal urine flow and formation of amniotic fluid. Maternal oral hydration is more effective than intravenous hydration in patients with 3rd trimester oligohydramnios⁴. In pregnancies complicated by isolated oligohydramnios, hydration therapy significantly improves the quantity of amniotic fluid.⁵ Acute oral hydration is a noninvasive, easily accessible and cheap intervention, and an effective way of increasing AFV.⁶ Maternal oral hydration therapy significantly increases the AFI, reduces the caesarean section rate and improves the foetal outcome.⁷ Oral

hydration therapy is simple to perform, non-invasive, non-expensive, easy to accept and an effective way of increasing AFI and results in improvement in perinatal outcome and decrease in operative interference⁸. One local study found that with intravenous hydration (n=113), mean AFI was increased to 5.89±0.374cm while with oral hydration (n=113) significantly more increase was observed i.e. 7.48±3.03 (P=0.000). Authors concluded that oral hydration is more effective than intravenous hydration in patients with 3rd trimester oligohydramnios.⁴ But another local study found that with intravenous hydration (n=25), mean AFI was increased to 7.7±1.35cm while with oral hydration (n=25), mean AFI was increased to 7.5±1.68cm (lower than intravenous). The difference was found to be insignificant (P= 0.6447). Authors concluded that intravenous as well as oral hydration increases AFI in women with oligohydramnios but neither appears to be advantageous over the other to increase AFI and both routes may be beneficial in the management of oligohydramnios.³ Rationale of my study is to compare the mean AFI with oral versus intravenous maternal hydration for management of females presenting with oligohydramnios in third trimester of pregnancy. Through literature it was noticed that oral hydration is more beneficial than intravenous hydration. But contradiction was also present. In routine we use intravenous hydration therapy for management of oligohydramnios as oral hydration is not preferred due to controversy. So to confirm the more beneficial method, we want to conduct this study. This will help us to improve our practice and guidelines for management of oligohydramnios with more appropriate, effective and advantageous method.

MATERIALS AND METHODS

200 patients were included in this study, the performa was designed to record the demographic data and lab tests advised and also ultrasound of abdomen of every patients was conducted. The study was conducted at Idris Teaching hospital Sialkot Medical College Sialkot from Jan 2017 to Jan 2018. The written informed consent was taken from every patient before the start of the study . The permission of Ethical Committee was considered before start of the sampling and publishing in medical forum journal. The Data was analyzed for results on SPSS version 10.

Inclusion criteria: Women of age 18-40 years presenting at gestational age 28-42 weeks (duration of gestation was calculated by 1st trimester scan) with AFI <5cm (on ultrasound)

Exclusion criteria: Ruptured membranes (on clinical examination)

Multiple pregnancies (on ultrasound)

PIH (BP≥140/90mmHg), pre-eclampsia (BP≥140/09mmHg with proteinuria ≥+1 on dipstick method) or eclampsia (convulsions with PIH)

Chronic or gestational Diabetes (BSR>186mg/dl)

Maternal cardiac disease (abnormal ECG and medical record)

Maternal renal disease (S. creatinine >1.2mg/dl)

Maternal anemia (Hb <10 mg/dl)

Fetal congenital anomaly (on ultrasound)

Women taking prostaglandin synthetize inhibitors (on medical record and history)

RESULTS

The mean age of the patients was 28.68±6.85 years with minimum and maximum ages of 18 & 40 years respectively. Table 1

In our study 71(35.50%) patients were primiparous, 50(25%) patients had parity one, 48(24%) patients had parity two and 31(15.50%) patients had parity three. Figure 1

The mean gestational age was 32.95±3.18 weeks with minimum and maximum gestational age of 28 & 38 weeks respectively. Table 2

The mean pre-treatment AFI was 4.07±0.36cm with minimum and maximum pre-treatment AFI were 3.5 & 4.6 respectively. Table 3

The mean post-treatment AFI was 4.09±0.37cm with minimum and maximum post-treatment AFI were 3.5&4.6 respectively. Table 4

The mean pre-treatment AFI in group A was 4.06±0.37cm and in group B was 4.07±0.36cm. Statistically insignificant difference was found between the pre-treatment AFI and groups i.e. p-value=0.291. Table 5

The mean post-treatment AFI in group A was 4.09±0.38cm and in group B was 4.09±0.36cm. Statistically there is insignificant difference was found between the post-treatment AFI of groups i.e. p-value=0.909. Table 6

In females <30years, the mean pre-treatment AFI in group A was 4.13±0.36cm and in group B was 4.09±0.36cm. In females of age≥30years, the mean pre-treatment AFI in group A was 3.93±0.34cm and in group B was 4.06±0.36cm. Statistically insignificant difference was observed between study group and pre-treatment AFI values stratified by age i.e. p-value>0.05. Table 7

In females <30years, the mean post-treatment AFI in group A was 4.16±0.37cm and in group B was 4.10±0.37cm. In females of age≥30years, the mean post-treatment AFI in group A was 3.96±0.36cm and in group B was 4.08±0.36cm. Statistically insignificant difference was observed between study groups and post-treatment AFI values stratified by age i.e. p-value>0.05. Table 8

In primiparous females, the mean pre-treatment AFI in group A was 4.07 ± 0.37 cm and in group B was 4.10 ± 0.34 cm. Multiparous patients, the mean pre-treatment AFI in group A was 4.04 ± 0.37 cm and in group B was 4.04 ± 0.38 cm. Statistically insignificant difference was observed between the study group and pre-treatment AFI values stratified by parity i.e. p -value >0.05 . Table 9

In primiparous females, the mean post-treatment AFI in group A was 4.09 ± 0.38 cm and in group B was 4.12 ± 0.35 cm. In multiparous patients, the mean post-treatment AFI in group A was 4.07 ± 0.38 cm and in group B was 4.06 ± 0.37 cm. Statistically insignificant difference was observed between study groups and post-treatment AFI stratified by parity i.e. p -value >0.05 . Table 10

In normal BMI females, the mean pre-treatment AFI in group A was 3.96 ± 0.33 cm and in group B was 3.84 ± 0.35 cm. In overweight and obese females, the mean pre-treatment AFI in group A was 4.12 ± 0.38 cm and in group B was 4.15 ± 0.33 cm. Statistically insignificant difference was observed between the study group and pre-treatment AFI values stratified by parity i.e. p -value >0.05 . Table 11

In normal BMI females, the mean post-treatment AFI in group A was 3.99 ± 0.33 cm and in group B was 3.87 ± 0.36 cm. Similarly in overweight and obese females, the mean post-treatment AFI in group A was 4.15 ± 0.39 cm and in group B was 4.17 ± 0.33 cm. Statistically insignificant difference was observed between the study group and post-treatment AFI values stratified by parity i.e. p -value >0.05 . Table 12.

Table No.1: Descriptive statistics of age (years)

Age (years)	n	200
	Mean	28.68
	SD	6.85
	Minimum	18
	Maximum	40

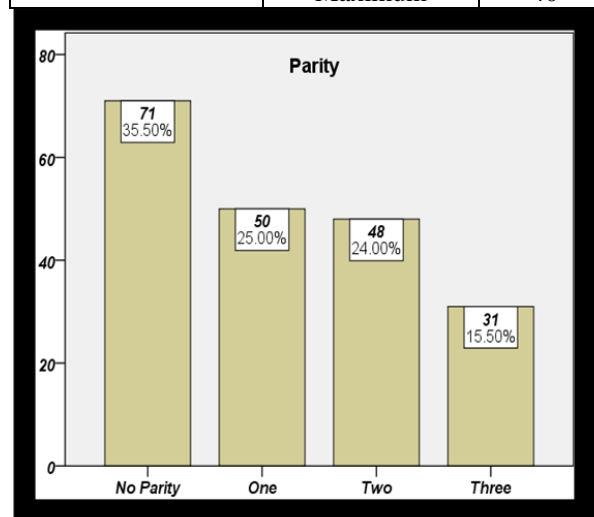


Figure No.1: Frequency distribution of parity

Table No.2: Descriptive statistics of gestational age (weeks)

Gestational age (weeks)	n	200
	Mean	32.95
	SD	3.18
	Minimum	28
	Maximum	38

Table No.3: Descriptive statistics of pre-treatment AFI

Pretreatment AFI	n	200
	Mean	4.07
	SD	0.36
	Minimum	3.5
	Maximum	4.6

Table No.4: Descriptive statistics of post-treatment AFI

Post-treatment AFI	N	200
	Mean	4.09
	SD	0.37
	Minimum	3.5
	Maximum	4.6

Table No.5: Comparison of pre-treatment AFI with study groups

		Study Groups	
		Group A	Group B
		n	100
Pre-treatment	Mean	4.06	4.07
	SD	0.37	0.36

Group A= Oral hydration Group B=Intravenous hydration
t-value=-0.291 p-value=0.771 (Insignificant)

Table No.6: Comparison of post-treatment AFI with study groups

		Study Groups	
		Group A	Group B
		n	100
Post-treatment	Mean	4.09	4.09
	SD	0.38	0.36

Group A= Oral hydration Group B=Intravenous hydration
t-value=-0.115 p-value=0.909 (Insignificant)

Table No.7: Comparison of pre-treatment AFI with study groups stratified by age

Age (years)	Study groups	Pre-treatment AFI	p-value
< 30	Group A	4.13 ± 0.36	0.489
	Group B	4.09 ± 0.36	
≥ 30	Group A	3.93 ± 0.34	0.094
	Group B	4.06 ± 0.36	

Group A= Oral hydration Group B= Intravenous hydration

Table No.8: Comparison of post-treatment AFI with study groups stratified by age

Age (years)	Study groups	Post-treatment AFI	p-value
< 30	Group A	4.16 ± 0.37	0.437
	Group B	4.10 ± 0.37	
≥ 30	Group A	3.96 ± 0.36	0.134
	Group B	4.08 ± 0.36	

Group A= Oral hydration Group B= Intravenous hydration

Table No.9: Comparison of pre-treatment AFI with study groups stratified by parity

Parity	Study groups	Pre-treatment AFI	p-value
Primiparous	Group A	4.07±0.37	0.627
	Group B	4.10±0.34	
Multiple	Group A	4.04±0.37	0.982
	Group B	4.04±0.38	

Group A= Oral hydration Group B= Intravenous hydration

Table No.10: Comparison of post-treatment AFI with study groups stratified by parity

Parity	Study groups	Post-treatment AFI	p-value
Primiparous	Group A	4.09±0.38	0.685
	Group B	4.12±0.35	
Multiple	Group A	4.07±0.38	0.839
	Group B	4.06±0.37	

Group A= Oral hydration Group B=Intravenous hydration

Table No.11: Comparison of pre-treatment AFI with study groups stratified by BMI

BMI	Study groups	Pre-treatment AFI	p-value
Normal	Group A	3.96±0.33	0.195
	Group B	3.84±3.56	
Overweight & Obese	Group A	4.12±0.38	0.584
	Group B	4.15±0.33	

Group A= Oral hydration Group B=Intravenous hydration

Table No.12: Comparison of post-treatment AFI with study groups stratified by BMI

BMI	Study groups	Post-treatment AFI	p-value
Normal	Group A	3.99±0.33	0.172
	Group B	3.87±0.36	
Overweight & Obese	Group A	4.15±0.39	0.685
	Group B	4.17±0.33	

Group A= Oral hydration Group B= Intravenous hydration

DISCUSSION

This present randomized control trial was carried out at department of Obstetrics and Gynaecology, Idris Teaching Hospital Sialkot Medical College Sialkot to compare the mean amniotic fluid index with oral versus intravenous maternal hydration for management of females presenting with oligohydramnios in third trimester of pregnancy Adequate amniotic fluid (AF) volume is considered to be important for fetal well-being.^{8,9,10} The determination of an association between oligohydramnios and poor fetal outcome requires the investigation of the factors involved in the maintenance of AF volume, and maternal hydration, among these, seems to play a relevant role^{11,12,13}In our study the mean value of post-treatment AFI of the patients was 4.09±0.37cm, post-treatment AFI of the patients in oral hydration group was 4.06±0.37cm and in intravenous hydration group was 4.07±0.36cm. Statistically there is insignificant difference was found between the post-treatment AFI values with study group i.e.

p-value>0.05. Oral hydration group patients does not have significant difference as compared to intravenous hydration to increase the amniotic fluid.^{14,15} A study by Zakaria Nada et al¹⁶ described that In group "A"(Oral hydration): (mean change: 1.5 cm; percentage 25%; paired t test: 11.77; P<0.001). In group "B"(IV hydration): (mean change: 2.64±0.9cm; percentage 28%; paired t test: 9.27; P<0.001). There was a decrease in urine specific gravity in both groups. Two days post hydration. They showed that Oral hydration is effective as intravenous hydration in significantly increase the AFI in third trimester idiopathic oligohydramnios. Oral hydration is more convenient. Maternal oral hydration is more effective than intravenous hydration in patients with 3rd trimester oligohydramnios⁴. Another studies,^{17,18,19} demonstrated a significant increase in AF index (approximately 30%) in women with oligohydramnios, 2-4 h after water hydration. Repeating the study in women with a normal AF index, they reported an increase of 3 cm (16%) in AF index with water.²⁰ A study,²¹ demonstrated an increase in AF index in women with oligohydramnios after hydration with intravenous infusion of hypotonic fluid or with oral water. Maternal oral hydration is more effective than intravenous hydration and hypotonic solutions superior to isotonic solutions²². The improvement in AFV appears to be time-dependent rather than daily-dose dependent. Acute oral hydration is a noninvasive, easily accessible and cheap intervention, and an effective way of increasing AFV.²³ Maternal oral hydration therapy significantly increases the AFI, reduces the caesarean section rate and improves the foetal outcome^{24,25} Some studies have suggested that although oral hydration increases the amount of amniotic fluid in women with oligohydramnios, no significant increase would be observed in women with normal amniotic fluid volume. A study was carried about comparison of the effect of oral and intravenous fluid therapy on women with oligohydramnios, they revealed that maternal hydration with oral water was more effective than other groups. Oral hydration therapy is simple to perform, non-invasive, non-expensive, easy to accept and an effective way of increasing. AFI and results in improvement in perinatal outcome and decrease in operative interference.²⁶ Another study compared a 6 day treatment protocol consisting of isotonic intravenous fluid (1500ml) plus a hypotonic oral fluid intake (1500ml versus 2500ml) to a cohort of untreated controls. Both treatments resulted significantly effective in improving the AFI index [p<0.0001] with no significant differences observed between the two hydration schemes. Interestingly, similar effects were collected by Fait et al. in a cohort of cases treated by a 2000ml intake hypotonic fluid administered orally for 14 days.

CONCLUSION

It has been proved in our study that there is insignificant difference between oral and intravenous hydration groups for management of females presenting with oligohydramnios in third trimester of pregnancy

Author's Contribution:

Concept & Design of Study: Syeda Fakhra Gillani
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 Final Approval of version: Syeda Fakhra Gillani

Conflict of Interest: The study has no conflict of interest to declare by any author.

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