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Oral and Intravenous Maternal Hydration in third trimester Idiopathic Oligohydramnios:Effects and Duration.

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Abstract:
Objective:*To study the effects of oral and intravenous maternal hydration in third trimester idiopathic or isolated oligohydramnios, and to determine the duration of actions.*
Design: Prospective clinical study.
Setting:*OB/GYN department, Benha Teaching Hospital, Benha, Egypt.;*
Patient(s):*34 pregnant patients, about 35 weeks gestation, with idiopathic oligohydramnios.*
Intervention(s):*acute oral and intravenous maternal hydration.*
Main Outcome Measure(s):*The current study was conducted on 34 pregnant mothers with amniotic fluid index (AFI) of < 6 cm and gestational age of about 35 weeks. The pregnant women were equally divided into two groups, "A" and "B". Just before starting hydration and for all the participants, amniotic fluid index and urine specific gravity had been measured.Group "A", received two liters of water over 2 hours. Group "B", received intravenous 2 liters of isotonic saline over 2 hours. Reevaluations of AFI and urine specific gravity in both groups had been made 2 hours after finishing hydration. Then, AFIwas rechecked again every 2 days for a week. Independent t-test and paired t-test were used to compare the two groups and mean AFI before and after treatment, respectively.*
Result(s):*Hydration of mothers, oral or parenteral, significantly increased the AFI. In group "A": (mean change: 1.5 cm; percentage 25%; paired t test: 11.77; P<0.001). In group "B": (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, 11women (64.7%) from group "A" and 10 women (58.8%) from group "B"their AFI were <6cm. The maximum duration of actionof acute hydration was about one week.*
Conclusion(s): *Oral hydration is effective as intravenous hydration in significantly increase the AFI in third trimester idiopathic oligohydramnios. Oral hydration is more convenient. It is cheaper, non-invasive and does not need special arrangement.The advantageous effect of maternal hydration is temporary; and oral hydration every two days may be recommended till delivery.*
Key Words: *Amniotic fluid index; Clinical trial; Hydration of mothers; Oligohydramnios*

I. Introduction

Oligohydramnios complicates 4.0-5.5% of pregnancies. It is associated with adverse fetal outcomes. The perinatal morbidity and mortality rate may increase to 56.5 with oligohydramnios[1]. In addition, oligohydramnios increases five to seven times the cesarean section rate[2].Oligohydramnios is usually associated with premature rupture of membrane (PROM),fetal congenital anomalies, IUGR, posmaturity, hypertension, diabetes mellitus, autoimmune disorders, hypovolemic statesand iatrogenic. The incidence of idiopathic types is about 7% of oligohydramnios [1].

Various treatment modalities have been evaluated and none is satisfactory. The authors in [3] found that rehydration after a period of fluid deprivation significantly increases the AFI. Maternal hydration therapy improves the quantity of amniotic fluid and the pregnancy outcome in third-trimester isolated oligohydramnios [2].

The increase in AFI after hydration may be attributed to improve uteroplacental perfusion through volume expansion[4, 5], or may be through increase fetal urine output [6] or may be due to maternal osmotic changes [7].

Additional studies are needed to understand the role of maternal hydration in correction of oligohydramnios, and to manipulate efficaciously and safely the maternal fluid intake.

The aim of this research is to studyeffects of oral and intravenous hydration on third trimester unexplained oligohydramnios, andto determine the duration of actions.

II. Patients and methods

This study was done in OB/GYN department of Benha Teaching Hospital, between the periods 2009 to 2012. The chosen patients had the following criteria: singleton pregnancy about 35 weeks gestation,

unexplained oligohydramnios (AFI less than 6 cm), no medical disorders, no fetal congenital anomalies and no PROM. The entire participants were instructed to avoid dehydration and to take regularly the daily requirement of water,especially during the two days before starting the study.

For all the participants, there was no sign of fetal distress and the ultrasound and AFI were measured by one person using Toshiba machine with 3.5 MHzprobe.The number of the selected women was 34, and they were divided into two groups; Group "A": 17womenfor oral hydration.Group "B": 17 womenfor intravenous hydration.

Before starting hydration, AFI and urine specific gravityhad been measured after the non-stress test. Two hours after finishing the procedure, reassessments of AFI and urine specific gravity had been done. Amniotic fluid index was rechecked after two days and followed up regularly.

In maternal oral hydration, the pregnant woman was instructed to drink two liters of water over two hours. In intravenous hydration, two liters of 0.9% normal saline was given over two hours. Instruction was clear for close monitoring and to pick up early sign and symptoms of fluid over load.

All measurement values were expressed as mean ± SD and 95% confidence interval (CI). Independent t-test and paired t-test were used to compare the two groups and mean amniotic fluid index before and after treatment, respectively.The statistical significance was accepted at the level $P < 0.05$. Statistics was done using SPSS packages and Stat most packages.

III. Results

In all selected pregnant women, there was no vomiting or any side effects from fluid intake; only nausia in few women. Their vital signs during hydration and afterward were stable.The clinical characteristics of the studied womenshowed no significant difference between the two groups regarding age, body mass index (BMI), gravidity and parity (table: 1). All the gestational age for all participants wasabout 35 weeks.

Table 1: Clinical characteristics of the studied women:

Character	Group "A" No=17	Group "B" No=17	P
Age (years)	24.2±2.5	26.3±2.3	<0.415
BMI	27.1±3.0	29.2±2.8	<0.398
Gravidity	2.2±1.2	3.2±0.8	<0.361
Parity	1.0±0.7	2.1±0.9	<0.233

No= number, P= Probability value.

Table 2: The effect of maternal oral hydration on AFI (group "A"):

Characters	Before hydration	After hydration
AFI (cm)	5.3±0.4	8.28±0.8
Difference (cm)	2.98±0.8	
Percentage	25.0	
Paired t-test	11.77	
Probability value	<0.001	

Table 3: The effect of maternal intravenous hydration on AFI (group "B"):

Characters	Before hydration	After hydration
AFI (cm)	5.1±0.4	7.74±0.96
Difference (cm)	2.64±0.9	
Percentage	28.0	
Paired t-test	9.27	
Probability value	<0.001	

Both oral and intravenous hydration was associated withhigh significant (0.001) increase of AFI (table: 2&3). There was no advantage of giving parenteral over the oral route. However, the oral route was more convenient to the participants.

Table 4: The effect of maternal oral hydration on urine specific gravity (group "A"):

Characters	Before hydration	After hydration
Urines specific gravity	1016.7±2.78	1012.7±2.56
Difference	4±1.3	
Percentage	41.0	
Paired t-test	9.72	
Probability value	<0.001	

Table 5: The effect of maternal intravenous hydration on urine specific gravity (group "B"):

Characters	Before hydration	After hydration
Urine specific gravity	1018.7±1.55	1013.5±2.1
Difference	5.2±1.3	
Percentage	41.0	
Paired t-test	12.64	
Probability value	<0.001	

Maternal hydration was associated with high significant (0.001) decrease in urinary specific gravity in both groups (table: 4&5).

Table 6: Duration of the increase in AFI after oral and parenteral maternal hydration:

Type of hydration (Groups)	No. of women with AFI ≥6 "post hydration"				
	2hours	2 days	4 days	7 days	9 days
Group "A"	17	6	2	1	-
Group "B"	17	7	3	1	-

No. =number.

Most of the pregnant women (64.7% in the oral group and 58.8% in the parenteral group), their AFI returned back to the pretreatment levelsby the end of the second day post hydration. Themaximum duration of theincrease in AFI after hydration was about one week (table: 6).

IV. Discussion

The results of the current study show that both oral and intravenous hydration significantly increased the amniotic fluid index in the isolated or idiopathic oligohydramnios. Neither oral nor intravenous hydration appearedadvantageous over the other. The mechanism of these changes is not clear; it may be related to the increase of the uterine placental perfusion [8], or due to the acute reduction of maternal plasma osmolality [6]. Most of the studies,if not all, after oral hydration [9, 10, 11, 12, 13] or after intravenous hydration [14, 15, 16]are coinciding with our findings.

Most of the studied women, more than 50 %, their AFI returned back to the pre-hydration levels by the end of second day post hydration. About one week post hydration, oral or parenteral groups, no woman was found with AFI ≥6.In a study done bythe authors in [12],the positiveeffect of hydrationon AFI was less than 24 hours in duration. More research is necessary for this topic.

In conclusion: The complications of oligohydramnios cause the mother and the fetus to suffer from many problems. Maternal hydration is an effective method in management of idiopathic oligohydramnios. This method can eliminate the need to terminate the pregnancy before term which has bad consequences on the mother and the fetus. There is no advantage of intravenous over oral hydration. Since it can be done at home,non-invasive,low costing, does not exhaust the resources, and convenient to the women; oral hydration is recommended. In most of the pregnant women, theeffect of hydration is lasting two days. So,extended period of hydrationis recommended; 2.5 liters per dayevery two days till the time of delivery.

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References

[1]. Cunningham FG, Williams JW, Leveno KJ, Bloom S, Hauth JC. Williams Obstetrics. 23rd ed. New York: McGraw-Hill Medical; 2009. 495p.
[2]. Ülker K. Maternal hydration therapy improves the quantity of amniotic fluid and the pregnancy outcome in third-trimester isolated oligohydramnios.J Ultrasound Med. 2014 May;33(5):922.
[3]. Wolman I, Groutz A, Gull I, Gordon D, Geva E, Lessing JB, Jaffa AJ. Is amniotic fluid index influenced by a 24 hours fast? J Reprod Med, 45 (8): 685-687.
[4]. Flack NJ, Sepulveda W, Bower S, Fisk NM. Acute maternal hydration in third-trimester oligohydramnios: effects on amniotic fluid volume, uteroplacental perfusion, and fetal blood flow and urine output. Am J Obstet Gynecol. 1995 Oct;173(4):1186–91.
[5]. Calhoun S. Focus on fluids Examining maternal hydration and amniotic fluid volume. AWHONN Lifelines. 1999 Dec-Jan;3(6):20–4.
[6]. Oosterhof H, Haak MC, Aarnoudse JG. Acute maternal rehydration increases the urine production rate in the near-term human fetus. Am J Obstet Gynecol. 2000;183(1):226–9.

[7]. Doi S, Osada H, Seki K, Sekiya S. Effect of maternal hydration on oligohydramnios: a comparison of three volume expansion methods. Obstet Gynecol. 1998 Oct;92(4 Pt 1):525–9.
[8]. Kilpatrick SJ, Safford KL. Maternal hydration increases amniotic fluid index in women with normal amniotic fluid. Obstet Gynecol. 1993 Jan;81(1):49–52.
[9]. Patrelli TS, Gizzo S, Cosmi E, Carpano MG, Di Gangi S, Pedrazzi G, Piantelli G, Modena AB. Maternal hydration therapy improves the quantity of amniotic fluid and the pregnancy outcome in third-trimester isolated oligohydramnios: a controlled randomized institutional trial. J Ultrasound Med. 2012 Feb;31(2):239-44.
[10]. Akter MD, Kabir N, Shah MS, Islam F, Tasnim S. Effect of maternal oral hydration therapy in oligohydramnios.Mymensingh Med J. 2012 Oct;21(4):723-8.
[11]. Ghafarnejad M, Tehrani MB, Anaraki FB, Mood NI, Nasehi L. Oral hydration therapy in oligohydramnios. J ObstetGynaecol Res. 2009 Oct;35(5):895-900.
[12]. Malhotra B, Deka D. Duration of the increase in amniotic fluid index (AFI) after acute maternal hydration.Arch Gynecol Obstet. 2004 Mar;269(3):173-5. Epub 2003 Oct 24.
[13]. Magann EF, Doherty DA, Chauhan SP, Barrilleaux SP, Verity LA, Martin JN Jr. Effect of maternal hydration on amniotic fluid volume. Obstet Gynecol. 2003;101(6):1261–5.
[14]. Shahnazi M,SayyahMeli M,Hamoony F,Sadrimehr F,Samani F,and Koshavar H.The Effects of Intravenous Hydration on Amniotic Fluid Volume and Pregnancy Outcomes in Women with Term Pregnancy and Oligohydramnios: A Randomized Clinical Trial. J Caring Sci. 2012 Sep; 1(3): 123–128.
[15]. Yan-Rosenberg L, Burt B, Bombard AT, Callado-Khoury F, Sharett L, Julliard K, Weiner Z. A randomized clinical trial comparing the effect of maternal intravenous hydration and placebo on the amniotic fluid index in oligohydramnios. J Matern Fetal Neonatal Med. 2007 Oct;20(10):715-8.
[16]. Umber A, Chohan MA. Intravenous maternal hydration in third trimester oligohydramnios: effect on amniotic fluid volume. J Coll Physicians Surg Pak. 2007 Jun;17(6):336-9.