ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, S Iss 2, 2022

Effectiveness of Oral Hydration Therapy on Oligohydramnios among Antenatal Mothers

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ABSTRACT:

Context: Oligohydramnios is a dangerous condition for health of the fetus and is linked to higher foetal morbidity. If the proper steps are not done in a timely manner, this condition frequently raises the chance of various outcomes. Early oligohydramnios identification and therapy may contribute to a drop in caesarean births and a reduction in perinatal morbidity and death.

Aim: Evaluate oral hydration therapy for improving AFI in cases of antenatal mothers with oligohydramnios.

Methods: A pre-experimental research design (one group pre and post intervention) was carried out 36 antenatal mother with singleton pregnancy and gestational age between 32-34 weeks with oligohydramnios (AFI≤6) were selected based on non- probability convenience sampling technique. Data collection was performed based on the interview schedule. The study subjects were asked to drink 1500ml of water per day orally for seven days apart from their daily fluid intake. AFI measurement was carried out on day zero and day seven.

Results: Majority of the mothers has severe level of oligohydramnios (69.4%) in pre - intervention. After the oral hydration therapy mothers has normal (50%), mild (19.4%) and moderate (30.6%) level of oligohydramnios. The pre intervention mean: 5, SD =0.793 and post intervention mean: 7.53, SD =1.54. It was highly significant at $p<0.000$.

Conclusion: The oral hydration therapy was more effective to improving the level of Amniotic Fluid Index among antenatal mothers with oligohydramnios. It was a simple and safe measure with nil adverse effects for mother and fetus.

Keywords: Amniotic Fluid Index, Antenatal Mothers, Effectiveness, Oligohydramnios, Oral Hydration Therapy.

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INTRODUCTION:

Successful outcome of obstetric wellbeing is assessed by obtaining healthy mother and child in modern obstetrics. (1) Amniotic Fluid (AF) is an important part of pregnancy sac and helps fetal development. (2) Amniotic fluid as a number of important functions like development of musculoskeletal system, gastrointestinal tract development, lung development, provides essential nutrients to fetus, protects fetus from trauma, and maintains body temperature and it has bacteriostatic properties. (3)

In pregnancy, oligohydramnios happens when amniotic fluid levels are decrease than predicted for the foetus gestational age. The fluid that surrounds the foetus in the uterus is called amniotic fluid. It protects the foetus from contamination and umbilical cord constriction whilst in the womb, as well as cushioning their motions. Amniotic fluid also aids in the development of the foetus digestive and respiratory systems, as well as maintaining their temperature. (4)

Oligohydramnios is a condition that affects 1 to 5% of all pregnancies. This illness has the potential to endanger both the mother and the fetus during pregnancy. Prolonged labour, mal-presentation, and fetal difficulties such as abortion, cord compression, deformity owing to intra-amniotic adhesions, pulmonary hypoplasia, Potter's syndrome, club foot and hand, and hip dislocation are all frequent maternal complications. (5)

In the worldwide, oligohydramnios was found in 0.2 percent of zombies and the Democratic Republic of Congo, and 1.5 percent in Pakistan. Oligohydramnios women’s had a greater rate of bleeding, foetal malposition, and caesarean birth than mothers who do not have oligohydramnios. The negative foetal and neonatal outcomes associated with oligohydramnios were determined such as stillbirth, neonatal mortality, low birth weight, and premature birth. (6)

The most prevalent cause of oligohydramnios was hypertensive disorders of pregnancy (35%), followed by IUGR (31%), PROM (17%), Post-dated (5%), and Idiopathic reasons (above 12%). The prevalence of LSCS was 43%. Neonatal admissions to the NICU were 26% owing to low birth weight, 20% due to prematurity, 8% due to meconium aspiration syndrome, and 8% due to congenital abnormalities. The posterior urethral valve had the highest prevalence of congenital abnormalities at 50%, followed by renal agencies at 25%. The rate of infant death was 5%. (7)

The management of maternal dehydration with oral or intravenous rehydration has been shown to improve the AFV by 30%. (8) Maternal oral hydration raises amniotic fluid levels via lowering maternal plasma osmolality, resulting in a higher AFI. The fluid balance of the mother has a significant influence on amniotic fluid. With oligohydramnios, increased maternal fluid consumption leads to an increase in AFI. Oral hydration for the mother is a safe and efficient treatment for oligohydramnios that has no negative effects. (9)

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The aim of the study was to improve the amniotic fluid index level through the oral hydration therapy.

METHODS:

This pre-experimental one group pre and post intervention research design was done in Arupadai Veedu Medical College & Hospital, Puducherry during the period of September 2021 to October 2021. The non- probability convenience sampling technique was used to select 36 antenatal mothers with oligohydramnios. The inclusion criteria were gestational age between 30-34 weeks, single conception, intact membranes, initial Amniotic Fluid Index 4-6cm and maternal age ranging from 18-35years. The informed consent was obtained from each participant. In pre intervention assessment of demographic data (including age, education, occupation, income, religion, family type, immunization status, booked status, dietary habits, number of gravida, weeks of gestation, age at marriage and duration of conception after marriage) was collected. The subjects were asked to drink 1500ml of water per day orally for seven days apart from their daily fluid intake. During the intervention, Intake/Output chart, maternal and fetal condition was monitored. On seventh day the Amniotic Fluid Index was measured through the ultrasonography. The effectiveness of oral hydration therapy was assess by the scoring method (Normal – 7cm and above, Mild oligohydramnios – 6cm to 7cm, Moderate oligohydramnios – 5cm to 6cm, Severe oligohydramnios – 4cm to 5cm).

STATISTICAL ANALYSES:

Descriptive and inferential analyses were reported as mean, median, standard deviation, frequency and percentage for different variables. The chi-square test was used to investigate the association between the pre intervention level of Amniotic Fluid Index and demographic variables. Paired “t” test was used to find effectiveness of oral hydration therapy. All analyses were performed by SPSS version 25 software. $P<0.05$ was considered significant.

RESULTS:

Overall, 36 participants were included in the study. Among 36, all are immunized during pregnancy, 32(88.9%) were booked and 4 (11.1%) were unbooked, 36(100%) were primi gravida. In weeks of gestation, 24(66.7%) were 32-33 weeks, 5(13.9%) belongs 30-31 weeks and 7(19.4%) were 34 weeks of gestation. In duration of conception after marriage, 17(47.2%) were less than 5 years, 13(36.1%) were less than 2 years, 6(16.7%) were less than 10 years and none of them in more than 10 years, respectively [Table 1].

The most of the antenatal mothers had 25 (69.4%) sever level of oligohydramnios and 11 (30.6%) had a moderate level of oligohydramnios in pre intervention, respectively. In post intervention 18 (50%) were in normal level of oligohydramnios, 11 (30.6%) of them in

ISSN PRINT 2319 1775 Online 2320 7876

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moderate level of oligohydramnios, 7 (19.4%) had mild level of oligohydramnios and none of them in sever level of oligohydramnios [Table 2].

Before oral hydration therapy the mean and standard deviation score was 5±0.793 and the post intervention score was 7.53±1.54. The mean difference was -2.52, respectively [Table3].

The demographic variables of dietary habits, duration of conception after marriage and weeks of gestation had shown statistically significant association between pre interventional levels of Amniotic Fluid Index with selelcted demogrphic variables with chi-square value of (χ^2=4.52, d.f=1), (χ^2=6.939, d.f=2) and (χ^2=4.68, d.f=2) at p<0.05 level. And other demogrphic variables of number of gravida and booked status had not shown significant association between pre interventioal levels of Amniotic Fluid Index with selelcted demogrphic variables [Table 4].

DISCUSSION:

Oligohydramnios is being detected more often these days due to routine use of obstetric USG (10). It is decreased amount of amniotic fluid volume around the fetus in amniotic cavity. It is more common in 3rd trimester and incidence increases of pregnancy continuous beyond term because of placental age. Oligohydramnios accompanies broad range of disorders and anomalies of fetus (multicystic kidneys, renal agenesis, urinary tract obstruction), maternal medical disorders affecting the plaacentalbed (anemia, IUGR, pre-eclampsia, viral infections, diabetes insipidus, dehydration) and prerupture of membranes leading to leakage of amniotic fluid (11). I selected the case of oligohydramnios for evaluating the effect of oral hydration therapy on Amniotic Fluid Index.

In the present study, 30 (83.2%) antenatal mothers with oligohydramnios were in the age group of 22-30 years. This findings similar to study conducted by Chauhan P et al (12), Swati N et al (10).

In this study oligohydramnios was more in primigravida 36 (100%) garmel et al (13) found 67% while jundial et al (14) found 60% of the women to be nalliparous with oligohydramnios. Another similar study done by Bhat et al (22) in which 56% cases were primigravida.

In this study majority of the antenatal mothers 32 (88.9%) had booked. Which is similar to study conducted by khajotia S et al (15).

In present study, the pregnant women were between 30-32 weeks of gestation which was very similar to the gestational age group of various previous studies like Qazi M et al (16) who included pregnancies between 28-34 weeks of gestation. Gowri R, Soundaraghavan S et al (17) included singleton pregnancies from 24-34 weeks of gestation.

In present study, the mean amniotic fluid index pre and post intervention was 5±0.793 and 7.53±1.54 respectively with p value <0.000 which is statistically highly significant. These

ISSN PRINT 2319 1775 Online 2320 7876

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readings almost similar to ali et al (18), observed pre and post intervention of oral hydration therapy was 0.37±0.07 and 2.7±0.8 with p value <0.001 respectively.

Ghafarnejad et al (19) reported that with maternal oral hydration therapy, mean AFI improved from 50.8 to 67.2mm (p<0.001) while it increase from 5 to 7.53 in 7 days in our study.

Literature suggests that oral hydration therapy increases the AFI in both oligohydramnios and normal pregnancy by 2.01cm (95% Cl: 1.43-2.56) and 4.5 cm (95% Cl: 2.9-6.1) respectively.(20,21)

The study findings were also agreed with study conducted in Faisalabad Medical University, Faisalabad. In this study conducted by mohamed alaa farghal et al the mean value of AFI before treatment was 3.6 for intervention group respectively. After receiving oral hydration therapy, mean AFI has increased to 8.6 in intervention group. (23)

Furthermore a randomized controlled trial study conducted by akter et al (24), maternal oral hydration therapy significantly increases the AFI, reduces the caesarean section and improves the fetal outcome.

Another study conducted by nada et al (25), aliand ahamed et al reported that oral hydration therapy was effective as intravenous hydratin in significantly increase the AFI in third trimester idiopathic oligohydramnios.

The study findings were supported by **Kiran S, Ameen A, Akram A,** reported that the mean amniotic fluid index (AFI) score before treatment was 3.34 ± 0.762 and after treatment was 5.61 ± 1.25 (p value=0.001). (26)

Another one study also supported by **Patrelli TS, Gizzo S** studied effects of hydration on oligohydramnios by giving intravenous infusion of 1500 mL of an isotonic solution per day for 6 days followed by home oral hydration therapy of 1500 mL/d subgroup A1 and 2500 mL/d subgroup A2. They reported significant improvement in amniotic fluid index in both subgroups (P < .001). (27)

The similarity study found **Lorzadeh N, Kazemirad S**, comparing oral and intravenous fluid therapy, oral hydration group (p<0.0001) had significant increase in AFI, but not in intravenous isotonic or hypotonic group which similar to our findings. (28)

CONCLUSIONS:

The complications of oligohydramnios causes the mother and the fetus to suffer from many problems. Therfore, oral hydration therapy of the mother is recommended as a low-cost method with no complications for the fetus and the mother. Maternal oral hydration therapy is simple, safe, non-invasive and effective method to improve the amniotic fluid volume in

ISSN PRINT 2319 1775 Online 2320 7876

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oligohydramnios but requires continious therapy for long-term to improve the neonatal outcome.

AUTHORS DICLARATION STATEMENTS:

Ethical approval and consent to participate

The present study has been approved by the Ethical Committee. All the participaqnts signed questionnaire and they were maintained.

Declaration of Competing Interest

Declarations of interest: none.

Authorship statement

All authors have approved the final manuscript.

Table 1: frequency and percentage distribution of demographic variables

Socio-Demographic Variables	Frequency (N)	Percentage (%)
Immunization during pregnancy		
Immunized	36	100
Not Immunized	0	0
Booked status		
Booked	32	88.9
Unbooked	4	11.1
Number of gravida		
One	36	100
Two	0	0
More than two	0	0
Weeks of gestation		
30-31	5	13.9
32-33	24	66.7
34	7	19.4
Duration of conception after marriage		
Less than 2 years	13	36.1
Less than 5 years	17	47.2
Less than 10 years	6	16.7
More than 10 years	0	0

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Table 2: Distribution of level of oral hydration therapy on oligohydramnios among antenatal mothers.

Level of oral hydration therapy on oligohydramnios	Pre intervention		Post intervention	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
NORMAL	0	0	18	50
MILD	0	0	7	19.4
MODERATE	11	30.6	11	30.6
SEVERE	25	69.4	0	0
Total	**36**	**100**	**36**	**100**

Table 3: Effectiveness of oral hydration therapy on oligohydramnios among antenatal mothers.

Oral hydration therapy	Mean	Standard deviaton	Mean difference	Paired 't' value	'p' value
Pre intervention	5	0.793	-2.52	-14.01	**0.000** HS
Post intervention	7.53	1.54			

-p < 0.000 highly significant

Table 4: Association between pre interventional levels of Amniotic Fluid Index with demographic variables among antenatal mothers.

Demographic variables	Pre interventional level of amniotic fluid index				Chi-square X^2	Df	P-value
	Moderate		Severe				
	N	%	N	%			
Dietary Habits							
Vegetarian	0	0	8	32	4.52	1	**0.033* S**
Non-Vegetarian	11	100	17	68			
Duration of conception after marriage							
Less than 2 years	5	45.5	8	32	6.939	2	**0.025* S**
Less than 5 years	5	45.5	12	48			

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Less than 7 years	1	9	5	20			
More than 10 years	0	0	0	0			
Booked status							
Booked	11	100	21	84	1.98	1	**0.159 NS**
Unbooked	0	0	4	16			
Number of gravida							
One	11	100	25	100	-	-	-
Two	0	0	0	0			
More than two	0	0	0	0			
Weeks of gestation							
30-31	1	9.1	4	16	4.681	2	**0.031* S**
32-33	9	81.8	15	60			
34	1	9.1	6	24			

NS – Non Significant ****-p<0.05, S-Significant***

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