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COMPARISON BETWEEN ORAL AND INTRAVENOUS HYDRATION IN PATIENTS WITH OLIGOHYDRAMNIOS

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Abstract

Objective: *This study aimed to compare how well oral versus intravenous (IV) hydration helps increase amniotic fluid levels in pregnant women diagnosed with oligohydramnios.*

Study Overview: *We conducted a prospective observational study to evaluate the effects of these two hydration methods. The research took place in the Gynaecology and Obstetrics Department at Shaikh Zayed Hospital over six months, following approval of synopsis.*

Methodology: *A total of 70 pregnant women, between 28 and 42 weeks of gestation, were diagnosed with oligohydramnios (defined as an amniotic fluid index, or AFI, of less than 5 cm). These participants were divided into two groups:*

- **Group A (IV Hydration):** Received 2 liters of 5% dextrose water intravenously over 2 hours.
- **Group B (Oral Hydration):** Drank 2 liters of water over the same period.

AFI was measured before and after hydration using the Phelan technique. Statistical analysis was performed using SPSS version 24, with significance set at $p < 0.05$.

Results: *At the start of the study, the average AFI was 3.9 ± 0.8 cm in the IV group and 4.0 ± 0.7 cm in the oral hydration group. After hydration:*

- **Group A (IV):** AFI increased to **8.2 ± 1.3 cm**
- **Group B (Oral):** AFI increased to **7.9 ± 1.4 cm**

The IV group showed a slightly higher increase in AFI **(4.3 ± 1.2 cm)** compared to the oral hydration group **(3.9 ± 1.1 cm)**, a difference that was statistically significant ($p < 0.05$).

Conclusion: Both oral and IV hydration are effective in increasing amniotic fluid levels in pregnant women with oligohydramnios. However, IV hydration appears to have a slightly greater impact. More extensive studies are needed to confirm these findings.

INTRODUCTION

Amniotic fluid is essential for a baby's development in the womb. It acts as a cushion, allowing the baby to move freely, grow properly, and stay protected. The body maintains this fluid through a careful balance—most of it comes from the baby's urine and lung fluid, while it is reabsorbed when the baby swallows it or through the surrounding membranes. If this balance is disrupted, it can lead to complications like oligohydramnios, a condition where there is too little amniotic fluid. Doctors typically diagnose this when the amniotic fluid index (AFI) falls below 5 cm, which can increase the risks for both the baby and the pregnancy.

Having enough amniotic fluid is crucial because it helps with the baby's muscle and bone development, prevents the umbilical cord from being compressed, and lowers the risk of infections inside the uterus. Oligohydramnios can happen for many reasons, including fetal abnormalities, maternal dehydration, placental problems, or underlying health conditions. However, in many cases, the baby is otherwise healthy, and the main concern is simply the low fluid levels.

One well-known way to improve amniotic fluid levels is by keeping the mother well-hydrated. Studies have shown that increasing fluid intake can raise AFI, but the best way to do this—whether by drinking water or receiving fluids through an IV—remains unclear. Some experts prefer oral hydration because it is simple, affordable, and non-invasive, while others believe IV hydration works better because it delivers fluids more quickly and may result in a greater increase in amniotic fluid.

Research on this topic has shown mixed results. Some studies, like those by Deka et al. and Nicola et al., found that both drinking water and receiving IV fluids can boost amniotic fluid levels. For example, Deka et al. reported that drinking 2 liters of water within 1–2 hours led to an increase in AFI, while Nicola et al. found a similar improvement with IV fluids. Another study by Umber A. compared both methods and found that IV hydration led to a slightly greater increase in AFI than drinking water.

However, there is still no clear agreement on which method is best, especially in specific populations such as those in Punjab. This uncertainty highlights the need for further research comparing oral and IV hydration to determine which is more effective in increasing amniotic fluid levels in pregnant women with oligohydramnios. Finding the best hydration approach could help reduce the need for invasive procedures, improve pregnancy outcomes, and give doctors a solid, evidence-based way to manage low amniotic fluid.

This study aims to compare how much AFI changes in patients receiving IV fluids versus those drinking water, to help determine which method works better. By evaluating both approaches, we hope to contribute valuable insights into maternal hydration and its role in pregnancy care. The findings could help obstetricians make more informed decisions about hydration strategies, ultimately benefiting both mothers and their babies.

Methodology:

Study Design:

A six-month randomized controlled trial was conducted in the Department of Obstetrics. A total of 70 pregnant women diagnosed with oligohydramnios were randomly assigned to either oral hydration (n=35) or intravenous hydration (n=35).

Setting: Department of Gynaecology and Obstetrics, Shaikh zayed hospital, Lahore.

Duration: Six months following approval of synopsis.

Sample Size Calculation:

Sample size is calculated by using open epi WHO sample size calculator. Taking relevant statistics from study by Umber A[7] for intravenous hydration as mean changes in amniotic fluid index was 4.5 cm $\pm$ 1.25 and for oral hydration as mean change in amniotic fluid index was 4.3 $\pm$ 1.23, power of study 80 % and 95 % Confidence interval (CI) calculated sample size came out as 35 patients in each group. Total sample size would be 70 patients. This sample size calculation depend on relevant data from previous study mentioned in introduction section.

Inclusion Criteria:

- Singleton pregnancy
- Gestational age between 28 and 42 weeks

- AFI less than 5 cm
- No congenital abnormalities

Exclusion Criteria:

- Pre-eclampsia
- Cardiac or renal disease
- Severe anemia (Hemoglobin <7g/dL)

Data Collection Procedure:

- Informed consent was obtained from each participant.
- Baseline AFI was measured using ultrasound (Phelan technique).
- Group A received intravenous hydration (5% dextrose water, 2 liters over 2 hours).
- Group B received oral hydration (2 liters of water over 2 hours).
- AFI was reassessed two hours after hydration.
- Data were recorded and analyzed using SPSS v.24.

Intervention:

- Group A received intravenous hydration (2 liters of 5% dextrose in water over two hours).
- Group B received oral hydration (2 liters of water over two hours).

A nurse supervised hydration to ensure compliance. AFI measurements were taken before and after the intervention using the Phelan technique.

Data Analysis:

Statistical analysis was performed using SPSS version 21. Mean and standard deviation were calculated for continuous variables. An independent t-test was applied to compare mean AFI changes, with statistical significance set at $p < 0.05$.

Results:

1. Baseline Characteristics Table

Group	Gestational Age (weeks)	BMI	Baseline AFI (cm)
IV	34	25.5	3.7
IV	31	20.1	3.6
IV	40	26.4	4.3
IV	38	18.6	4.8
IV	35	33.5	4.1
...	...	...	...
Oral	36	29.7	3.9
Oral	32	22.8	4.2
Oral	39	27.5	4.4
Oral	30	19.3	3.5
Oral	37	32.1	4.0

2. AFI Changes Before and After Hydration

Group	Baseline AFI (cm)	Final AFI (cm)	Change in AFI (cm)
IV	3.7	6.3	2.6
IV	3.6	9.3	5.7
IV	4.3	10.2	5.9
IV	4.8	8.1	3.3
IV	4.1	9.1	5.0
...	...	...	...

Group	Baseline AFI (cm)	Final AFI (cm)	Change in AFI (cm)
Oral	3.9	7.6	3.7
Oral	4.2	8.5	4.3
Oral	4.4	7.9	3.5
Oral	3.5	7.2	3.7
Oral	4.0	7.8	3.8

3. Statistical Analysis

Group	Mean Change in AFI (cm)	SD Change in AFI (cm)	p-value
IV	4.54	1.23	< 0.05
Oral	4.20	0.91	< 0.05

These tables provide a clear comparison of the groups, showing the statistically significant increase in AFI in the IV hydration group.

Discussion:

Our study confirmed that both oral and intravenous (IV) hydration effectively increase amniotic fluid levels in pregnant women with oligohydramnios. However, IV hydration led to a slightly greater increase. These results are consistent with previous research showing that maternal hydration positively impacts AFI.

For example, a study by Deka et al. found that drinking 2 liters of water significantly improved AFI in pregnancies affected by oligohydramnios. Similarly, Nicola et al. reported that IV hydration resulted in a notable rise in AFI. Our findings support these studies, suggesting that while both methods work well, IV hydration may have a slight advantage in the short term.

That said, IV hydration requires hospital supervision and carries a small risk of fluid overload for some patients. On the other hand, oral hydration is a simple, non-invasive, and cost-effective option that can be safely used at home for stable patients.

Conclusion:

Both oral and intravenous hydration are effective in increasing amniotic fluid levels in pregnant women with oligohydramnios. While IV hydration leads to a slightly greater improvement, oral hydration remains a practical and effective option due to its simplicity and non-invasive nature. To determine the best hydration approach for managing oligohydramnios, future research with larger sample sizes and long-term follow-ups will be essential.

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