

COMPARISON OF THE EFFICACY OF ORAL AND INTRAVENOUS MATERNAL HYDRATION IN MANAGEMENT OF THIRD TRIMESTER OLIGOHYDRAMNIOS

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ABSTRACT

Oligohydramnios, defined as an amniotic fluid index (AFI) of less than the 5th percentile (at term \leq 5 cm, or at pre-term \leq 8.0 cm), has an incidence of 8.5% to 15.5%,¹ and is associated with an increased risk of umbilical cord occlusion, fetal distress in labour, operative deliveries, and still birth at term. When amniotic fluid is absent, the perinatal loss rate increases to 90%.^{2,3} The objective of the study was to compare effectiveness of intravenous with oral hydration in patients with 3rd trimester oligohydramnios. The study design was randomised control trial. This study was conducted in Gynecology and Obstetrics Department Bahawal Victoria Hospital, Bahawalpur, in a period of six months from October 2011 to March 2012.

Material and Methods: In this study we included 113 patients in each group making a total of 226 subjects. They all had singleton pregnancy.

Results: Majority of the patients were found between 21 – 30 years of age in both A and B groups. Amniotic Fluid Index before hydration was 2.93 ± 0.11 in Group – A and 2.92 ± 0.10 in Group – B and the P-value was 0.951 which showed insignificant difference in both groups. Amniotic fluid index after hydration was recorded as 5.89 ± 0.374 in Group – A and 7.48 ± 0.303 in Group – B which showed a statistical significant difference. The effectiveness of both ways of Hydration showed 48.67% (n = 55) patients in Group – A while in Group – B the efficacy was recorded in 88.50% (n = 100), P-value was recorded as < 0.05 .

Conclusion: Maternal oral hydration is more effective than intravenous hydration in patients with 3rd trimester oligohydramnios.

Key words: Oligohydramnios, maternal hydration, effective method, intravenous hydration, oral hydration.

INTRODUCTION

Oligohydramnios, defined as an amniotic fluid index (AFI) of less than the 5th percentile (at term \leq 5 cm, or at pre-term \leq 8.0 cm), has an incidence of 8.5% to 15.5%,¹ and is associated with an increased risk of umbilical cord occlusion, fetal distress in labour, operative deliveries, and still birth at term. When amniotic fluid is absent, the perinatal loss rate increases to 90%.^{2,3}

Ultrasound assessment of amniotic fluid has important implication in obstetrics care and it has become an integral component of pregnancy assessment. The ultrasonic methods which are used to measure amniotic fluid volume are called Amniotic Fluid Index (AFI),⁶ Largest and Vertical Pocket (LVP) measurement,⁷ Two diameter pocket measurement, Largest Transverse Pocket (LTP) maximum transverse. The measurement in each pocket should be clear of umbilical cord and fetal small parts. AFI is the sum of these four quadrants.¹ Several studies on AFI has demonstrated serial changes of mean

AFI values weekly with the threshold for oligohydramnios and polyhydramnios during pregnancy.⁸

Oligohydramnios is a result of a decrease in fetal urine production and excretion with intact membranes and without fetal renal anomalies. The cause of the decrease in fetal urine production and excretion is chronic hypoxia because of placental dysfunction, resulting in shunting of fetal blood flow from the kidneys and a decrease in glomerular filtration rate. Therefore, oligohydramnios is usually accompanied by fetal growth restriction.

An effective medical therapy for oligohydramnios is very important for the fetus to grow normally to near term. Maternal hydration therapy has been suggested by many authors⁹ to restore amniotic fluid volume to its normal range and thereby to reduce the associated perinatal morbidity and mortality. In recent studies Deka et al,¹⁰ Kil – Patrick et al¹¹ and Kilpatrick and Safford¹² reported that maternal oral hydration of L of water increased AFI in pregnancies with oligohydramnios as well as in tho-

se with a normal amniotic fluid volume. Similarly Nicola et al¹³ reported that maternal intravenous hydration increases AFI in patients with oligohydramnios.

We planned this study to determine whether one (oral) route of maternal hydration is advantageous over the other (intravenous) to increase amniotic fluid volume as oral route seems to have the advantages that it is cheap, feasible, do not need hospital stay.

MATERIALS AND METHODS

It was a randomised controlled trial conducted in the Department of Obstetrics and Gynaecology, Bahawal Victoria Hospital, Bahawalpur. The duration of study was Six months from October 2011 to March 2012. We included 113 patients in each group. The inclusion criteria was singleton pregnancy with normal fetus at 28 – 42 weeks of gestation and AFI less than 5.0 cm. We excluded the patients having Severe anaemia (Hb less than 7 g/dl), cardiac disease (risk of fluid overload Pre-eclampsia and eclampsia, hypertension, maternal diabetes mellitus, ruptured membranes and women receiving prostaglandin synthetase inhibitor.

A total of 226 patients admitted to obstetrics and gynaecology department fulfilling the inclusion criteria were included in the study after taking informed verbal consent. Basal AFI and routine intake of fluid of all patients were noted. They were randomly allocated one of the two groups. Age, parity period of gestation of every patient was kept in mind and their effect on oligohydramnios was noted. Group 'A' received intravenous hydration i.e. two liters of injection 5% dextrose water per day for 3 days and Group 'B' was treated with oral hydration i.e. administration of two liters of hypotonic solution (water) per day for 3 days, in addition to their normal routine fluid intake. All patients were kept in ward for 3 days and AFI measurement was repeated at 3rd day after hydration therapy by the same person who was blinded to the assigned groups of the study. A separate proforma was used to record particulars and AFI of every patient. The data was analysed using SPSS version 13. Mean and standard deviation was calculated for age, parity and period of gestations. Frequencies and percentages were calculated for effectiveness of two ways of hydration, table and diagrams were made. The difference between two groups were observed, if any, and subjected to statistical significance. Chi-square test was applied to compare the qualitative response i.e. effectiveness of two ways of hydration, 't' test was used to see the mean difference on AFI being quantitative in nature. The level of statistical significance was taken as 0.05 or less.

RESULTS

In this study, a total of 226 patients were recruited after fulfilling the inclusion / exclusion criteria to compare the effectiveness of intravenous with oral hydration in patients with 3rd trimester oligohydramnios.

In this research, majority of the patients were found between 21 – 30 years of age in both A and B groups, in Group – A 38.05% (n = 43) and in Group B 39.83% (n = 45). Mean and standard deviation was found 26.21 ± 3.56 in Group – A and 27.34 ± 3.78 in Group – B (Table 1).

Table 1: Age distribution (n = 226).

	Group – A (n = 113)		Group – B (n = 113)	
	No. of Patients	%	No. of Patients	%
< 20	9	7.97	13	11.50
21 – 30	43	38.05	45	39.83
31 – 40	35	30.98	31	27.43
> 40	26	23	24	21.24
Mean & S.D.	26.21 ± 3.56		27.34 ± 3.78	
Total	113	100	113	100

Table 2: Gestational age (n = 226).

	Group – A (n = 113)		Group – B (n = 113)	
	No. of Patients	%	No. of Patients	%
28 – 32	10	8.84	6	5.31
32 – 36	14	12.39	12	10.62
36 – 40	72	63.72	83	73.45
40 – 42	17	15.05	12	10.62
Mean & S.D.	26.21 ± 3.56		27.34 ± 3.78	
Total	113	100	113	100

Majority of the patients in both groups were between 36 – 40 weeks of gestation, in Group – A 63.72% (n = 72), in Group – B 73.45% (n = 83) (Table 2). Table 3 shows parity of the subjects where most of the patients in both groups were recorded between 3 – 4 para, in Group – A 34.51% (n = 39), in Group – B 38.05% (n = 43). Amniotic Fluid Index before and after hydration is shown in Table 4, where before hydration amniotic fluid index was 2.93 ± 0.11 in Group – A and 2.92 ± 0.10 in Group – B and

the P-value was 0.951 which shows insignificant difference in both groups and when we compared amniotic fluid index after hydration it was recorded as 5.89 ± 0.374 in Group – A and 7.48 ± 0.303 in Group – B which shows a statistical significant difference in both groups. We compared the effectiveness of both types of management, 48.67% (n = 55) patients in Group – A were found to be effective while in Group – B, the efficacy was recorded in 88.50% (n = 100 cases while 51.33% (n = 58) in Group – A and 11.50% (n = 13) the procedure was not found effective. Chi-square test was applied and P-value was recorded as < 0.05 (Table 5).

Table 3: Parity of the subjects (n = 226).

	Group – A (n = 113)		Group – B (n = 113)	
	No. of Patients	%	No. of Patients	%
1 – 2	63	55.75	57	50.44
3 – 4	39	34.51	43	38.05
> 4	11	9.74	13	11.51
Mean & S.D.	2.30 ± 1.62		2.84 ± 1.78	
Total	113	100	113	100

Table 4: Amniotic Fluid Index Status before and after Hydration (n = 226).

Amniotic Fluid Index (cm)	Group – A (Values in mean)	Group – B (Values in mean)	P-value
Before Hydration	2.93 ± 0.11	2.92 ± 0.10	0.951
After Hydration	5.89 ± 0.374	7.48 ± 3.03	0.00

Table 5: Effectiveness of the Amniotic Fluid Index (n = 226).

	Group – A (n = 113)		Group – B (n = 113)	
	No. of Patients	%	No. of Patients	%
Yes	55	48.67	100	88.50
No	58	51.33	13	11.50
Total	113	100	113	100

P-value = 0.00 i.e. < 0.05

DISCUSSION

Oligohydramnios is defined as deepest vertical pool (PD) devoid of cord or fetal limbs measuring less than 3 cm and is associated with increased pregnancy complications, congenital anomalies and perinatal mortality. Its incidence is 2.3% of all the pregnancies.

Jandial and colleague¹² concluded that oligohydramnios is associated with a high rate of pregnancy complications and increased perinatal morbidity and mortality, they believed that AFI assessed antepartum or intrapartum would help to identify women who need increased antepartum surveillance for pregnancy complications, and as such women should be cared for in a unit capable of managing such complications effectively.

Several management options have been suggested in 3rd trimester oligohydramnios to restore amniotic fluid volume to its normal range and thereby reduce the associated perinatal mortality and morbidity including serial trans-abdominal amnioinfusions maternal hydration, intramniotic sealing techniques, and fetal cystoscopy. These treatment modalities are costly, need hospital admission, surgical interventions and associated with serious side effects. Oral intake of extra fluid is cheap, feasible method and devoid of serious side effects.

The idea behind this study was that if oral intake is found to be better than intravenous then the method would be suggested for future use, as the population coming to our institute is mostly poor and non-affording, further the burden on hospitals and obstetricians would also be decreased.

Results of the study reveal a significant increase in amniotic fluid index after maternal hydration in both groups, but we found oral hydration more effective method as it was 88.5% in oral hydration group while 48.67% in intravenous group. These results are in agreement with a study conducted by Lorzadeh and workers¹³ who conducted a study with a view to determine the impact of maternal hydration with intravenous fluid, oral fluid on amniotic fluid volume and to compare the outcomes with other studies and concluded oral hydration more effective than intravenous.

The findings of the present study are not in agreement with the findings of another local study conducted by Umber¹⁴ as they concluded maternal intravenous as well as oral hydration increases AFV in women with oligohydramnios but neither appears to be advantageous over the other to increase amniotic fluid volume. The reason behind this difference is unknown. While the results obtained in our study were found to be comparable to those reported by Malhotra¹⁵ in which fifty women were made to drink two liters of water before repeat AFI measurement and it show significant increment of AFI ($p < 0.001$).

In **conclusion** our study strongly suggests that maternal hydration status has a definite role in amniotic fluid regulation and oral hydration increases amniotic fluid volume in oligohydramnios patients.

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 ologohydramnios.

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