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A DESCRIPTIVE ASSESSMENT OF ELEVATION IN THE MEAN INDEX OF AMNIOTIC FLUID AMONG PREGNANT WOMEN IN THIRD TRIMESTER OLIGOHYDRAMNIOS AFTER INTRAVENOUS MATERNAL HYDRATION

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Abstract:
Objective: *The objective of this study was to assess the elevation in mean amniotic fluid index among pregnant females after the management of intravenous maternal hydration during third-trimester oligohydramnios.*
Material and methods: *We conducted this descriptive research at Services Hospital, Lahore from February 2018 to January 2019 on a total of 156 pregnant cases who were enrolled after the assessment of an increase in the mean amniotic fluid index. The study population was enrolled after meeting inclusion criteria and we also took the permission of ethical review committee.*
Results: *According to the outcomes the mean age of our selected population was (27 ± 3.0) years, the mean gestational age was (37 ± 2.4) weeks, mean weight was (68.4 ± 2.7) kg, mean AFI before hydration was (3.5 ± 0.6) and mean AFI increase after hydration was (6.3 ± 0.8); whereas, mean AFI increase was (2.9 ± 0.7). There was an increase in amniotic fluid volume in maternal hydration among oligohydramnios patients (CI 95%, P-Value <0.001 and 2.9 cm mean change in amniotic fluid index). The mean increase in the percentage of AFI was (87% ± 33.5%).*
Conclusion: *In the settings of this research there was an increase in the maternal intravenous hydration among AFV women who were in the third-trimester oligohydramnios which may help to treat oligohydramnios and pregnancy continuation to the point of the term without any complication in the course of pregnancy.*
Keywords: *Oligohydramnios, Maternal Hydration, Amniotic Fluid Volume, Pregnancy, Gestational Age and Committee.*

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INTRODUCTION:

The occurrence of oligohydramnios is (8%) reported in the last trimester of the pregnancy. The estimates suggest 12% of the total pregnancies in the 41st week of pregnancy [1 – 2]. Common causes attributing to oligohydramnios include different Fetal causes (congenital factors, chromosomal defects, post-term pregnancies, IUGR, fetal demise); Maternal causes (hypertension, dehydration, diabetes, preeclampsia, uteroplacental insufficiently) and Drugs causes (ACE inhibitors, indomethacin, Idiopathic isolated oligohydramnios) [1 – 3]. This obstetric complication has also a correlation with intrauterine restriction of growth, fetal pulmonary development impairment, increased fetal distress risk, congenital malformations, intrauterine death, higher surgical delivery rates, small for gestational age and meconium aspiration [3]. Mid-gestation fetal urine starts to enter in the amniotic sac and fetus starts swallowing secretion of amniotic fluid from fetal lungs which are added into the smaller contribution of AFV may also occur in the fetal skin. It ceases with keratinization at 22nd to 24th gestational week. At a later stage of gestation, the amniotic fluid produces in the fetal urine and lung liquid and clearance takes place through fetal swallowing.

There is an increase in the amniotic fluid volume from 30 ml to 1 litre from 10th week to 34th to 36th weeks which reduces in the 40th gestational week (800 ml). The decline rate is high as fifty millilitres in a week at 38th to 43rd gestational weeks. Amniotic fluid circulates constantly with a higher estimated exchange rate per hour (3600 ml). Fetal lung, fetal urination and fetal swallowing are important contributors in the movement of the fluid during late gestation. Fetal disorders which affect one of these processes will also affect on AFV [4].

Various authors have also studied the association between amniotic fluid volume and maternal intravascular volume [5]. Intravenous maternal hydration is less invasive, easy and safe than other invasive procedures which pose improved maternal compliance. It reduces delivery-related complications and improve neonatal prognosis [6]. Hypotonic solutions and Intravenous maternal hydration lead to osmotic variations which are associated with a reduction in the fetal osmolarity, amniotic fluid formation and improved fetal urine flow [7].

Few authors reported an increase in the volume of amniotic fluid respective 58.6% and 95% after intravenous maternal hydration in third-trimester oligohydramnios with hypotonic solution [6, 8]. Maternal osmotic change instead of expansion in the maternal volume has a direct and increased impact on the increased volume of amniotic fluid along with an acute intravenous maternal hydration. No proper treatment exists for third-trimester oligohydramnios. Therefore, the objective of our study was to assess the elevation in mean amniotic fluid index among pregnant females after the management of intravenous maternal hydration during third-trimester oligohydramnios.

MATERIAL AND METHODS:

We conducted this descriptive research at Services Hospital, Lahore from February 2018 to January 2019 on a total of 156 pregnant cases who were enrolled after the assessment of an increase in the mean amniotic fluid index. The study population was enrolled after meeting inclusion criteria and we also took the permission of ethical review committee. The patients were selected in the age group of 18 – 35 years with parity of Gravida – 5. These patients were singleton pregnant, AFI < 5 cm and gestational age (28 – 40) weeks. We did not include all those women who were at the risk of overload of fluid with renal impairment (RFTs), cardiac, diabetes, severe preeclampsia, membranes rupture, fetal congenital anomalies, acute febrile illness and significant haemorrhages.

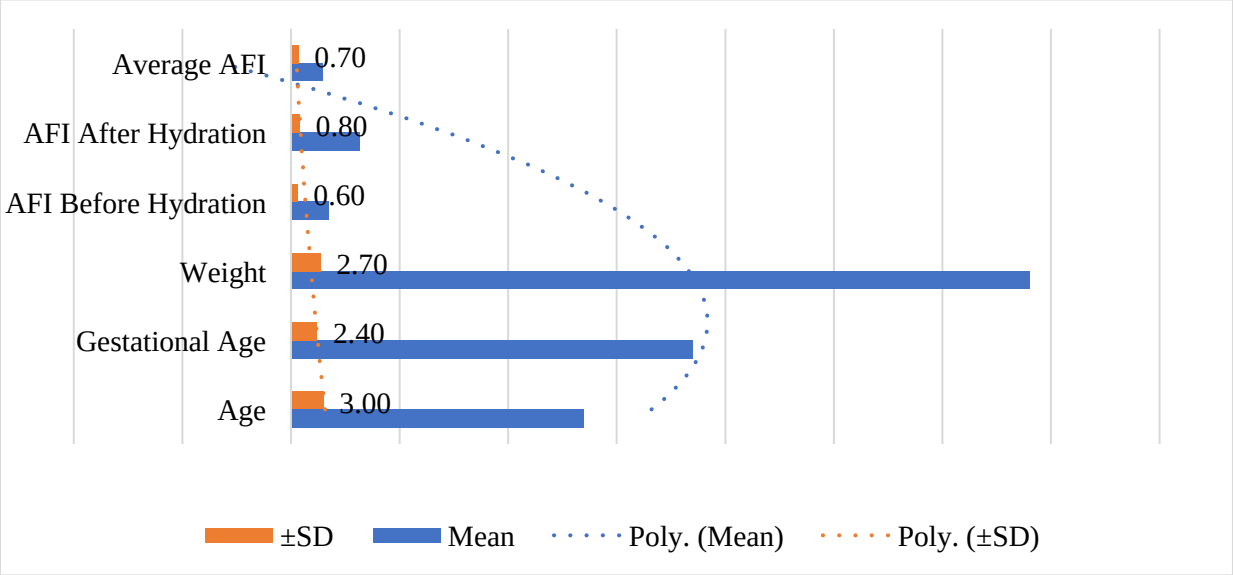
All those patients who fulfilled the criteria were enrolled as the study population after USG and clinical evidence. We can determine the volume of amniotic fluid with the method by making four quadrants of the uterus; we also calculated the deeper pool and combined all the four measurements. Patients were observed for different baseline features along with detailed past history, present history, demographic features and obstetrics history as well. Patients received antenatal supervision while hospitalized. We also repeated AFI measurements and dehydration. Post-hydration AFI and maternal hydration was performed once.

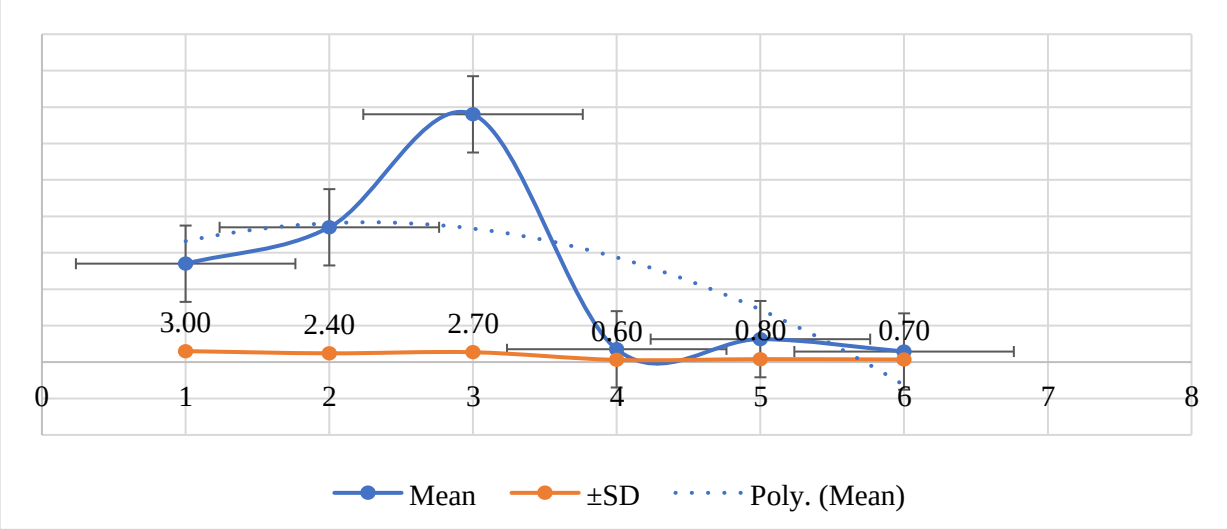
RESULTS:

According to the outcomes the mean age of our selected population was (27 ± 3.0) years, the mean gestational age was (37 ± 2.4) weeks, mean weight was (68.4 ± 2.7) kg, mean AFI before hydration was (3.5 ± 0.6) and mean AFI increase after hydration was (6.3 ± 0.8); whereas, mean AFI increase was (2.9 ± 0.7). There was an increase in amniotic fluid volume in maternal hydration among oligohydramnios patients (CI 95%, P-Value <0.001 and 2.9 cm mean change in amniotic fluid index). The mean increase in the percentage of AFI was (87% ± 33.5%). Detailed average values of Age, Gestational Age, Weight, AFI, Before Hydration, AFI After Hydration and Average AFI are given in the tabular data.

Table: Average Values of Various Variables

Average Values	Mean	±SD
Age	27.0	3.00
Gestational Age	37.0	2.40
Weight	68.0	2.70
AFI Before Hydration	3.5	0.60
AFI After Hydration	6.3	0.80
Average AFI	2.9	0.70





DISCUSSION:

In the third trimester oligohydramnios, there was a significant increase in AFI with intravenous acute maternal hydration. It shows that an increase in the volume of amniotic fluid is an outcome of either maternal plasma osmolality or volume of the maternal fluid. This increased AFI after maternal dehydration gives more time maturation and growth in utero. Pregnancy can also be prolonged up to term without reduced oligohydramnios or AFI complications. Fetal urine increased outcomes also increase AFI [4]. Another possible reason for this increase is because of reduced intramembranous amniotic fluid resorption against fetal plasma osmolality [6]. Our findings are in agreement with available evidence for maternal hydration role in the amniotic fluid dynamics [5 – 9]. The single deepest approach is the best to approach which may lead to a false diagnosis of oligohydramnios; whereas, most of the employed method is amniotic fluid index [10]. A regular volume of amniotic fluid in the course of pregnancy is a problem for the practising obstetrician. Important clinical decisions depend on a normal value of amniotic fluid or an abnormal volume. Oligohydramnios has an association with enhanced perinatal mortality and morbidity among diagnosed patients of oligohydramnios should receive suitable workup. Patients also require suitable antepartum surveillance.

Amniotic fluid index quantitatively indicates the volume of amniotic fluid. In the total of 156 patients, a total of 47 oligohydramnios patients presented an increase in AFI which was significantly 100%. According to Ghafernejad oligohydramnios among pregnant cases before and after hydration was respectively 50.8% and 67.2% [11]. It shows a significant increase in the AFI after acute dehydration. Maternal hydration also increases the index of amniotic fluid; neither time period nor mechanism is responsible for this change. In a few pregnancy states, there is a reduction in the amniotic fluid. The reason for this reduced volume is unknown. The major indicator of this reduced volume is fetal urine outcome after 24th gestational week. In adults, there is a direct association of diuresis with intravascular osmolality and volume. Clinical data is available about the respond of the fetus to maternal changes in wither osmolality and intravascular volume [14 – 15].
Experimental data present variations in the urine of the fetal with altered maternal osmolality, mannitol infusion and water deprivation. It results in a decrease in the flow of fetal urine in ewes and also implicates important variable like maternal osmolality [12, 13]. However, change in the osmolality and fetal volume can also change the output of fetal urine, fetal intravascular volume and fluid volume [16]. Flack points out that the rate of fetal urine production and AFI increases in the third-trimester oligohydramnios acute maternal hydration in pregnancies [17].

Doi is of the view that mother's hydration modified osmolality and as a result fluid volume increased more than the volume of the blood [18]. Few studies indicate improved uteroplacental perfusion with an increased volume of plasma among mothers with improved fetal oxygenation and improved renal blood flow rate [19]. We are not aware that whether the hydration status of the patient was good or not before intravenous hydration. The objective of this research was to determine the maternal hydration mechanism with an increase in the volume of amniotic fluid; therefore, implicated variables like intravascular volume, maternal osmolality, Doppler study and fetal urine production rate of feto-maternal circulation like descending aorta, umbilical artery, renal artery, middle cerebral artery and maternal uterine artery which were not measured. However, osmolality will decrease with the infusion of two litres hypotonic solution. Dassari found fetal distress cut-off values, MVP < 2cm and prolonged pregnancy AFI as < 8cm [20]. Bengal reported 16% pregnancy-induced hypertension, 16% post-dated pregnancy, 10% hydramnios among women having oligohydramnios [21]. The most common onset was of birth asphyxia with an Apgar score of (< 7) at one minute and five minutes) [22]. Neonatal sepsis and meconium aspiration contributed to the neonatal morbidity [23].

In the total of 156 women, the variation in AFI was more than mean change among 69 women. Mean change was reported among 2.6% women which can be attributed to different methodological problems and confounding variables. Moreover, relative maternal dehydration is required for maternal hydration which results in AFI increase. Reduced intake of fluid is a partial outcome of maternal dehydration [24]. Large-Scale research will be helpful for future research work.

CONCLUSION:

In the settings of this research, there was an increase in the maternal intravenous hydration among AFV women who were in the third-trimester oligohydramnios which may help to treat oligohydramnios and pregnancy continuation to the point of the term without any complication in the course of pregnancy.

REFERENCES:

1. Manzanares S, Carrillo MP, Gonzalez- Peran E, Puertas A, Montoya F. Isolated oligohydramnios in term pregnancy as an indication for induction of labour. J Matern Fetal Neonatal Med. 2007 March; 20(3): 221-4.
2. EKS, Andersson A, Johansson A, Kubica M. Oligohydramnios in uncomplicated pregnancies beyond 40 completed weeks. Fetal Diagn Ther. 2005; 20:182-185.
3. Danon D, et al. Prostaglandin E2 induction of labour for isolated oligohydramnios in women with an unfavorable cervix at term. Fetal Diagn Ther. 2007; 22:75-79.
4. B. Bengal V, A. Giri P, M. Sali B. Incidence of oligohydramnios during pregnancy and its effects on maternal and perinatal outcome. JPBMS. Vol.12(12).
5. Butt FT, Ahmed B. The role of antepartum transabdominal amnioinfusion in the management of oligohydramnios in pregnancy. J maternal fetal-neonatal med. March 2011; Vol24(3):453-7.
6. Umber A, Chohan MA. Intravenous maternal hydration in 3rd-trimester oligohydramnios; effects on amniotic fluid volume. J Coll Physician Surg Pak. 2007;17(6)336-9.
7. Salani KA, Sada KA. Maternal hydration for increasing amniotic fluid volume in Oligohydramnios. Bas J Surg. 2007.
8. Hofmeyr GJ; Gulmezoglu AM, Novikova N. Maternal hydration for increasing amniotic fluid volume and normal amniotic fluid volume. Cochrane database; Oct, 2009 CD000134.
9. Shahnaz M, Sayyah Meli M, Hamoony F, Sadrimehr F, Ghatre Samani F, Koshavar H. The effect of intravenous hydration on amniotic fluid volume and pregnancy outcomes in women with term pregnancy and oligohydramnios: A randomized clinical trial. Journal of caring sciences. Aug 2012;1(3):123-128.
10. Megann EF, Chauhan SP, Washington W, Whitworth NS et al. Ultrasound estimation of AFV using the largest vertical pocket containing umbilical cord: measure to or through the cord? Ultrasound Obstet Gynecol. 2002 Nov;20(5):464-7.
11. Ghafarnejad et al. Oral hydration therapy in Oligohydramnios. Obstetrical and gynaecological survey. March 2010;65(3);145-146.
12. Kilpatrick SJ, Safford KL. Maternal hydration increases AFI in women with normal amniotic fluid. Obstet Gynecol. Jan 1993;81(1):49-52.
13. Magann EF et al. The effect of maternal hydration on Amniotic fluid volume. Am J Obstet Gynecol. June 2003; Vol101(6):1261-1265.
14. Stevens AD, Lumber ER. The effect of maternal fluid intake on the volume & composition of fetal urine. J Dev Physiol. 1985; 7:161-166.
15. Lumbers ER, Stevens AD. Changes in fetal renal function in response to infusion of a hypoosmotic solution of mannitol to the ewe. J Physiol. 1983;343: 439-446.
16. Brace RA. Physiology of amniotic fluid volume regulation. Clin Obstet Gynecol. June 1997;40(2):280-9.
17. Flack NJ, Sepulveda W, Bower S, Fisk NM. Acute maternal hydration in third-trimester oligohydramnios: effect on amniotic fluid volume, uteroplacental perfusion, and fetal blood flow and urine output. Am J Obstet Gynecol. Oct 1995;173(4):1186-91.
18. Amin AF, Mohammad MS, Sayed GH, Abdel-Razik S. Prophylactic transcervical amnioinfusion in labouring women with oligohydramnios. Int J Obstet Gynecol. 2003;81(2):183-9.
19. Calhoun S. Focus on fluids. Examining maternal hydration and amniotic fluid volume. A WHONN Lifelines1999 Dec-2000 Jan;3(6):20-4.
20. Doi S, Osada H, Seki K, Sekiya S. Effect of maternal hydration on oligohydramnios: a comparison of three volume expansion methods. Obstet Gynecol. Oct1998;92(4):525-9.
21. Dasari P, NIVADTTA G, Raghavaran S, the maximal vertical pocket & AFI in predicting fetal distress. Int. J. Gynae obstet.2007;96(2):89-93.
22. Ahmad H, Munim S. Isolated oligohydramnios is not an indication for the adverse perinatal outcome. J Pak Med Assoc. 2009oct;59(10):691-4.
23. Zhang J, Troendle J, Meikle S, Klebanoff MA, Raybum WF. Isolated oligohydramnios is not associated with adverse perinatal outcomes. BJOG. 2004 March; 111(3):220-5.
24. Baster JK, Sehder Hm, Breckenridge, Oligohydramnios. e medicine updated: Oct3,2007.
25. Hofmey GJ; Gulmezoglu AM, Novikova N. Maternal hydration for increasing amniotic fluid volume and normal amniotic fluid volume. Cochrane database; Oct, 2009CD000134.
26. Partreli ST et al. The quantity of amniotic fluid and the pregnancy outcome in third trimester Isolated Oligohydramnios. American Institute of ultrasound in medicine. September 2011.

27. Oosterhof H, Haak MC, Aarnoudse JG. Acute maternal rehydration increases the urine production rate in the near-term human fetus. Am J Obstet Gynecol. 2008;183(1):226-9.
28. V.T.M Borges, J. Rososchansky, J.F. Abbade, A, Dias, J.C. Peracoli. Effect of maternal hydration on the increase of AFI. Braz J Med Biol Res. March 2011; Vol 44(3).