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EVALUATING THE EFFICIENCY OF L-ARGININE INFUSIONS AGAINST ALL ESSENTIAL AMINO ACIDS IN OLIGOHYDRAMNIOS PATIENTS

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ABSTRACT

Background: Oligohydramnios (low amniotic fluid) has been linked to a slew of problems, including mispresentations, umbilical cord compression, and meconium aspiration syndrome, all of which result in a higher rate of surgical delivery. The crux of therapy is keeping the mother hydrated and supplementing her with antioxidants and vital amino acids. There are many treatment options for oligohydramnios and oligohydramnios consequences. Objective: To assess the effectiveness of L-Arginine sachets vs EAA infusions for the treatment of oligohydramnios patients. Study Design: Comparative prospective research. Materials and Methods: Our research comprised 100 women diagnosed with oligohydramnios who visited a prenatal clinic. Only L-Arginine sachets were given to 50 patients (5 gm twice a day). Another 50 people had complete EAA infusions (200 ml on alternate day preceded by 500 ml of 10 percent fructodex). The results of both groups were calculated using the following criteria: mean rise in liquor, treatment supply interval, and neonatal survival. Results: The study and control groups were 32.3 and 31.6 weeks pregnant at the time of enrollment, respectively. In both groups, the mean AFI at the time of enrollment was 6.13 0.53, 6.10 0.31. Patients were born at a gestational age of 37 weeks (in study group 80 percent in control group 78 percent). The mean AFI at the conclusion of the treatment intervention was (8.63 0.71 in the study group and 8.53 0.70 in the control group, respectively), indicating a 2.50 0.18 improvement in the study group and 2.43 0.39 in the control group. These patients had no severe neonatal morbidity. In both groups, there was a significant increase in liquor volume. Conclusion: Treatments with L-Arginine and All EAA infusion led in a considerable increase in liquor and a longer pregnancy length. However, L-Arginine sachets are less expensive and do not need hospitalisation. There is also no substantial difference between the study and control groups' outcomes.

Key words: Oligohydramnios, L-Arginine Sachets, Infusions of All Essential Amino Acids.

INTRODUCTION

The foetus in the uterus is surrounded by amniotic fluid, which acts as a protective cushion. Between 32 and 36 weeks of pregnancy, the amniotic fluid swells by roughly a litre, then drops to 400 ml at term. AFI (amniotic fluid index) less than 8 on ultrasonography indicates oligohydramnios (USG). Moderate oligohydramnios is defined as a score of 5 to 7. Severe Oligohydramniosis is defined as fewer than 5, with a higher risk of surgical intervention, perinatal death, and morbidity. The early detection and treatment of oligohydramnios may lead to a positive outcome.

One of the most important prerequisites for proper foetal development and a healthy foetal outcome is amniotic fluid. Because of foetal discomfort, reduced amniotic fluid (oligohydramnios) increases the risk of caesarean/operative birth. Oligohydramnios has a tight relationship with.

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- Placental insufficiency that is chronic
- Fetal hypoxia caused by umbilical cord protrusion and cord compression as a result of membrane rupture
- Lung development issues
- Limited room for the foetus to develop
- An unsettling foetal heart rate during labour
- Aspiration of meconium syndrome
- Risk of premature labour
- In the fifth minute, the APGAR score dropped below 7.
- Neonatal intensive care unit admissions
- A stillborn baby.

The foetus becomes hypoxic as a result of persistent placental insufficiency, which activates autonomic nerve reflexes. As a consequence, blood flow is diverted to critical organs such as the brain or heart at the expense of renal circulation. A considerable decrease in urine flow causes oligohydramnios, which reduces the amount of intrauterine space available for healthy foetal development.The foetus may develop musculoskeletal abnormalities such as club foot and talipes with or without wry neck as a result of the pressure sensations. Fetal skin may grow dry and wrinkled, giving it an elderly appearance. Due to reduced amniotic flowing fluid in the tracheobronchial tree, pulmonary hyperplasia is a documented consequence.

Oxygen nitrate, Muscle tissue and hence blood arteries relax when exposed to a free radical compound. This free radical is mostly made from L-Arginine. L-Arginine may also aid in the elimination of waste products such as amonia. By transfer to L-glutamet and L-proline, it may be turned into glucose and glycogen.
Maintaining amniotic fluid content is influenced by maternal blood volume, hydration condition, and maternal osmolality. Intravenous infusions of all necessary amino acids raise osmolality and blood volume, resulting in a rise in amniotic fluid volume. This rise might possibly be attributed to an increase in utero-placental perfusion.

Aims & Objective

- To see whether L-Arginine can replace all EAA infusions in the treatment of Oligohydramnios.
- To compare two commonly used therapy methods for oligohydramnios patients.
- To ensure excellent foetal development and a positive foetal outcome in situations of oligohydramnios.
- To lower maternal and foetal morbidity and death by reducing early operational intervention.

Materials and Methods

In a prospective research done at the Department of Obstetrics and Gynecology, 100 women diagnosed with oligohydramnios attended a prenatal clinic. Following written informed permission, they were added. L-Arginine sachets were given to a study group of 50 individuals from the first unit of the OBGY department (5 gm twice a day with full glass for four weeks). And 50 patients in the second unit (control group) got a 200 mL infusion of all necessary amino acids every other day, followed by 500 mL of 10percent fructodex. Patients were assessed and followed up on.

1. AFI on USG: AFI was calculated using the four quadrants approach, which involves measuring the greatest pool of fluid in each of the uterus' four quadrants. Every two weeks, get a follow-up scan.
2. Prolonged labour till the baby is born.
3. Maternal and foetal outcomes following labour: evaluated in terms of:

- Meconium-stained liquor frequency
- Fetal distress during pregnancy
- Delivery method
- L.S.C.S. Indication
- The birth weight and APGAR scores of the foetus were investigated.

A thorough obstetric, menstrual, previous, personal, and family history was gathered, as well as general, systemic, and obstetric exams. Weekly, the abdominal circumference and fundal height were measured in centimetres. A log of the foetal movement and FHR was kept.

All blood and urine tests relating to the ANC profile were completed. As previously, oral iron, multivitamins, and calcium treatment were maintained.

Inclusion criteria:

- Cases of oligohydramnios with an AFI of 8
- A gestational age of 24 to 36 weeks;
- Pregnancy with a singleton
- The existence of healthy membranes.
- Pre-eclampsia with oligohydramnios.
- IUGR-positive oligohydramnios

Exclusion criteria:

- Pregnancies involving a foetus with congenital abnormalities.
- Diabetes mellitus during pregnancy
- Renal, cardiovascular, abdominal, and pulmonary disorders during pregnancy
- Preterm membrane rupture before labour (PROM)
- Preeclampsia with serious complication.
- Treatment for oligohydramnios in the past.
- Patients who refuse to consent.

Results

Table 1 shows that the majority of the cases was primigravidae (70 percent in study group, 74 percent in control group). During their trimester (range 29-35 weeks) scan for foetal development and amniotic fluid measurement, they were diagnosed with low AFI. The

average rise in AFI following intervention was 2.6018 in the study group and 2.2339 in the control group.

The perinatal outcome of the foetuses following intervention in the mothers is shown in Table 2. 64 foetuses were delivered vaginally out of 100 patients in the group and control group, with 34 from the study and 32 from the control group. In addition, 36 L.S.C.S. are necessary Foetal distress accounted for 30.55 percent of the L.S.C.S. indicators. This might be because oligohydramnios foetuses are more prone to undergo fluctuating acceleration and cord compression. Out of 36 L.S.C.S patients, 8 (4 from each group) had malpresentation, 8 (4 from each group) had previous L.S.C.S, 6 (3 from each group) had failed induction, and 3 had severe oligohydramnios .

Table 3 compares the results of previous research with those of the current investigation. Improvement in AFI following intervention is compared in previous studies to the current research. It also indicates that there is a substantial improvement in both the group and control group following intervention.

Table 4 shows the gestation of the foetus in weeks at the time of birth in both groups following intervention. Pregnancy was extended to 41 weeks in 80 percent of the experimental group and 78 percent of the control group.

Table 1: Data Comparisons

Maternal characteristics	**Number of patients (total 100)**	
	50 (study group)	**50 (control group)**
(mean ±SD)Age	28 ± 3.9	27.6 ± 4.1
Parity	35- primigravida (70%) 15-multigravida (30%)	37- primigravida (74%) 15-multigravida (30%)
The average gestational age	32.3 (range 24 to 36 weeks)	31.6(range 24 to 36 weeks)
Before intervention Mean AFI	6.13 ±0.53	6.1 ± 0.31
After intervention Mean AFI	8.63 ± 0.71	8.53 ± 0.70
AFI Increase on Average	2.60 ± 0.18	2.23 ±0.39

Table 2: Mode of delivery comparison

Mode of delivery	**Study group (50 patients)**		**Control group (50 patients)**	
	Vaginal	**Caesarean**	**Vaginal**	**Caesarean**
	34	17	32	19
Caesarean section indications				
Fetal anguish		5		6
Malpresentations		4		4
lscs from before		4		4
Induction failure		3		3
Oligohydramniosis severe		1		2
		17		19

Table 3: Comparison of results of the present study and previous studies

Amniotic fluid index	**Dois et al. (1998)**	**Magnan et al. (2003)**	**Malhotra et al. (2004)**	**Shripad et al(2013)**	**Present study (2016)**
pre treatment	7.1	9.6	6.8	6.9	6.13
Post treatment	9.9	11.1	11.1	10.3	8.63
AFI Improvement	3.8	1.5	1.5	3.4	3.5

Table 4: Status of Pregnancy Prolongation

GA in weeks at the time of delivery	**research group**	**Group in charge**
≤32	0	2
34-36	7	6
38-40	8	7
≥41	41	40

Discussion

Amniotic fluid serves a variety of purposes. It helps to avoid embryonic lung hypoplasia by allowing fluid to flow in both directions into the foetal bronchioles. When there is enough amniotic fluid, limb contractures are avoided. By avoiding adhesions between the foetus and the amnion, amniotic fluid shields the foetus from mechanical harm. During labour, oligohydramnios is known to produce varying degrees of umbilical compression and foetal hypoxia.

Because USG is so widely available these days, more and more instances of oligohydramnios are now being discovered. As a result, we can predict difficulties that may arise during labour and take essential preventative measures. Finding an efficient, cost-effective, and conveniently accessible therapy option for oligohydramnios is critical.

L-Arginine amino acid plus oral hydration, all aminoacids orally plus hydration, all amino-acids intravenous infusion, and Amnio-infusion are some of the therapeutic options.

Amnioinfusions controlled by serial ultrasonography have lately been attempted, with mixed results. Because it is an intrusive surgery, it entails the risk of foetal loss. It is difficult to find in India. As a result, it is not recommended as a therapy for oligohydramnios.

One of the therapy options is an EAA infusion followed with a 10% fructodex solution. Because of the preservation of hydration and the balance of essential nutritional agents, the amniotic excess fluid seems to improve. (5) Improving placental fluid transport by adequate hydration of the mother is a therapeutic strategy.

Osmotic forces govern water transfer between the mother and the foetus, with electrolyte gradients determining net transplacental water exchange, according to physiological principles. A decrease in the maternal foetal osmotic gradient allowed water transport to the foetus in an ovine research with mother fluid overloading, resulting in an increase in foetal urine output and hence a rise in the liquor. Fructodex solution is made up of 5 percent dextrose and 5 percent fructose. Dextrose and dextrose molecules pass through the placental barrier easily and provide energy to the developing foetus, making them potentially beneficial in growth-restricted foetuses.At the conclusion of the energy generation process, they are easily oxidised to water and carbon dioxide. Carbon dioxide is quickly expelled by the mother's lungs, and the leftover IV fluid serves as a hypotonic solution, causing osmotic dilation in even generally healthy foetuses and improving nutrition.

L-Arginine is a flexible amino acid that performs a variety of biological roles. It's a precursor for proteins as well as Nitric oxide (NO). As an endothelium-derived relaxing agent, nitric oxide is an essential regulator of placental perfusion. NO is produced by the stereospecific enzyme NO synthase via the L-Arginine/NO pathway, wherein L-Arginine is the sole substrate for the generation of NO. NO promotes renal artery vasodilation, which increases glomerular filtration rate (GFR) and, as a result, foetal urine output. By causing nitric oxide-mediated vascular dilation and platelet stability via a cyclic GMP-dependent mechanism, L-Arginine increases utero-placental blood flow. This helps the foetus develop by boosting the flow of nutrients to it. Because constriction of the arteries is a significant cause of hypertension, L-Arginine is an important amino acid that helps to decrease it. L-Arginine was shown to be beneficial in instances of pregnancy complications in a research by Ropacka et al. Similarly, Dera et al found that using L-Arginine was linked to a decreased incidence of surgical delivery and higher Apgar ratings at both 1 and 5 minutes in growth limited and pre-eclamptic individuals.It comes in a bag of 5-8 gramme powder or granules. For at least four weeks, it was administered with one full glass of water 2 times a day. So, in addition to the foregoing advantages of L-Arginine, hydration is enhanced, which leads to a large increase in AFI and the extension of pregnancy to term. This is also with a healthy foetus and no life-threatening issues.In 20 clinically and radiologically verified instances of oligohydraamnios, Abida Ahmad investigated the impact of intravenous infusions of 200 mL aminoacids and 500 mL 10% fructodex on different days. At the time of birth, the amniotic index had significantly improved. While L-Arginine sachets have the benefit of not requiring hospitalisation, the entire cost of all EAA is far lower. As a result, patient compliance is higher in the research group. The best treatment option for oligohydramnios instances is to take L-Arginine sachet twice a day with a glass of water to keep the mother hydrated.

Conclusion

Managing Oligohydramnios patients is a difficult task. The treatment's major goals are hydration management, growth restriction correction, and pregnancy extension to term. In resource-poor nations, treatments with L-Arginine as Well as all EAA infusion led in substantial improvements in liquor and pregnancy length, whereas L-Arginine sachets by Maternal hydration had similar outcomes.

REFERENCES:

1. Phelan JP, Ahn MO, Smith CV, Rutherford SE, Anderson E. Amniotic fluid index measurements during pregnancy. J Reprod Med 1987;32:601-4
2. Moore TR, Cayle JE. The amniotic fluid index in normal pregnancy. Am J Obstet Gynecol 1990;162:1168-73.
3. Mercer LJ, Brown LG, Petres RE, et al. A survey of pregnancies complicated by decreased amniotic fluid. Am J Obstet Gynecol 1984;149:355-61.
4. K.L. Senthil Kumar, Pradip Das, Dr. R. P. Ezhilmuthu. Formulation and evaluation of L-Arginine Sustained Release tablets. K.L. Senthil Kumar et al / J Biomed Sci and Res., Vol 2(3),2010,167-169.
5. Ritu Gupta, Sanjay Kumar Porwal, Madhusudan Swarnkar, Sanjeev Gupta. The role of intravenous Amino-acid infusion in oligohydramnios. Gupta et al., IJPSR, 2012; Vol. 3(10):3971-3974.

6. Palmer RM, Ashton DS, Moncada S. Vascular endothelial cells synthesize nitric oxide from Larginine. Nature 1988;333:664-6.
7. Lampariello C, De Blasio A, Merenda A, Graziano E, Michalopoulou A, Bruno P. Use of L-Arginine in intrauterine growth retardation (IUGR): Authors' experience. Minerva Ginecol 1997;49:577-81.
8. Staff AC, Berge L, Haugen G, Lorentzen B, Mikkelsen B, Henriksen T.Dietary supplementation with L-Arginine or placebo in women with pre-eclam-psia. Acta Obstet Gynecol Scand 2004;83:103-7.
9. Ropacka M, Kowalska J, Blumska-Hepner K, Markwitz W, Bręborowicz GH. Effect of L-Arginine on fetal outcome in IUGR fetuses. Arch Perinat Med 2007;13:30- 4.
10. Dera A, Ropacka M, Kowalska J, Markwitz W, Nycz P, Bręborowicz GH. The effect of L-Arginine treatment on the neonatal outcome from pregnancies complicated by intrauterine growth restriction and gestational hypertension. Arch Perinat Med 2007;13:35-9.
11. Abida Ahmad. Amino-Acid Infusion in Oligohydramnios. JK-Practitioner 2006;13(3);140-141.
12. Sreedharan R, Jajoo S. Effect of L-arginine on amniotic fluid index in oligohydramnios. Int J Reprod Contracept Obst Gynecol 2013;2:80-2.