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EFFECTIVENESS OF L-ARGININE IN OLIGOHYDRAMNIOS ON AMNIOTIC FLUID INDEX

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ABSTRACT

Background: Oligohydramnios is a common diagnosis in obstetrics and carries an increased risk of operative interference and perinatal mortality and morbidity. By proper management and identification of oligohydramnios can prevent perinatal risk and gate better outcome. This was suggested that administration of L-arginine (nitric oxide donor) has been improving the amniotic fluid index (AFI) in oligohydramnios. **Methods:** This is a prospective study conducted over a period of two years. A total of 110 women attending antenatal clinic of Jeevan Jyoti Hospital and Guru Gobind Singh Memorial Vanadana Women's Hospital, Allahabad, U.P. India, who were diagnosed with oligohydramnios were included. Women who fulfilled the inclusion criteria were prescribed L-arginine containing 3g for periods varying between 1 to 4 weeks. Change in amniotic fluid index was noted. **Results:** L-arginine increases the amniotic fluid index in cases of oligohydramnios by 2.03±0.39 cm. **Conclusions:** It was concluded that L-arginine could be a potent treatment option for treatment of oligohydramnios. However extensive long-term studies are required to evaluate its efficacy and effect on maternal and perinatal outcome also.

KEYWORDS: Oligohydramnios, L-arginine, Amniotic fluid index.

INTRODUCTION

The amniotic fluid is part of the baby's life support system. It protects your baby and aids in the development of muscles, limbs, lungs and digestive system. If the measurement of amniotic fluid is too low it is called oligohydramnios. It was quantified as an amniotic fluid

index (AFI) less than 5 cm.[1] However, now a more commonly used definition of oligohydramnios is amniotic fluid index less than the 5th percentile for the gestational age.[2] Oligohydramnios is associated with an adverse perinatal and maternal outcome. Ultrasound guided amnioinfusion is an option for treatment commonly being employed nowadays. Since it is an invasive procedure there is an inherent risk of fetal loss. Another modality employed since a long period of time is maternal hydration though results have been varied and there is no standard treatment protocol for the same. A recently propagated alternative for the treatment of oligohydramnios is the administration of L-arginine which has been found to be effective in cases of intrauterine growth restriction and Pregnancy Induced Hypertension.[3] However there is no literature as of yet studying the effect of L-arginine on amniotic fluid index. This study was conducted to see the effect of L-arginine administration on AFI in patients with oligohydramnios.

METHODS

The study was a prospective study conducted in Department of Obstetrics and Gynaecology Jeevan Jyoti Hospital, Allahabad, U.P. India, for a period of two years extending from March 2013 to March 2015. A total of 110 women attending antenatal clinic of Jeevan Jyoti Hospital and Guru Gobind Singh Memorial Vanadana Women's Hospital, Allahabad, U.P. India who were diagnosed with oligohydramnios were included following consent and fulfilment of criteria.

The ethical approval was taken from the Institutional Ethics Committee (IEC).

Selection Criteria

Patient giving consent for the study, gestational age between 28-36 weeks, Amniotic Fluid Index lesser than 5th percentile for the particular gestational age in the latest sonography.[2]

Exclusion Criteria

Patient not giving consent for the study, diagnosed major congenital anomalies, history of having received treatment for oligohydramnios were excluded from the study.

METHODS

Women who fulfilled the inclusion criteria were prescribed sachets of L-arginine containing 3g of the active ingredient for periods varying between 1 to 4 weeks. Repeat scan was done on follow up and the AFI noted. Change in AFI was noted.

RESULTS

The mean age of women in the study was 25.15±2.63 years. The mean gestational age at diagnosis of oligohydramnios was 31.4±1.57 weeks (Table 1).

Table 1: Distribution of women according to gestational age (weeks) at diagnosis.

Gestational age (weeks)	No. of Women (*n*=100)	Mean gestational age	Standard Deviation
28-30	32(29%)		
30.1-32	39(35.5%)	31.4	1.57
32.1-34	28(25.5%)		
34.1-36	11(10%)		

Women received treatment for 1-4 weeks with an average duration of treatment of 25.73±3.48 days (Table 2). The average change in AFI was 2.23±0.41 cm (Table 3).

Table 2: Distribution according to duration of treatment with respect to gestational age at diagnosis.

GA at diagnosis (weeks)	Duration of treatment (days)		
	8-14 days	15-21 days	22-28 days
28-30 (n=32)	2(6%)	8(25%)	22(69%)
30.1-32 (*n*=39)	1(2%)	12(31%)	26(67%)
32.1-34 (*n*=28)	1(3%)	10(36%)	17(61%)
34.1-36 (*n*=11)	4(36%)	6(55%)	1(9%)
Mean	24.73		
Standard Deviation	3.48		

Table 3: Average change in AFI (cm) according to duration of treatment.

GA at diagnosis (*n*=number of women)	8-14 days	15-21 days	22-28 days
28-30(*n*=32)	2.4	1.83	2.3
30.1-32(*n*=39)	0.8	2.06	2.57
32.1-34(n=28)	1.52	2.1	2.72
34.1-36(n=11)	1.64	2 .2	0.5
Average change in AFI	2.23		
SD	0.41		

DISCUSSION

With the easier availability of ultrasonography nowadays more cases of oligohydramnios are being identified. This helps us to be more cautious and anticipate problems especially during labour. However the need for an effective, economical, easily available treatment modality

remains unmet. Maternal dehydration has been always believed to cause oligohydramnios though it cannot be coined as the cause in every case. Recently, serial ultrasound guided amnioinfusions have been tried but with varying success rates. Moreover it carries the inherent danger of fetal loss as it is an invasive procedure. L-arginine is a versatile amino acid with a wide range of biological functions. It serves as a precursor not only to proteins but also nitric oxide which has been identified as endothelium-derived relaxing factor.[4] L-arginine increases uteroplacental blood flow through nitric oxide mediated dilatation of vessels thereby increasing the supply of nutrients to the fetus aiding its growth. In a study by Ropacka et al, L-arginine was found to be effective in cases of Intrauterine growth restriction.[3] Similarly in another study in growth restricted and pre-eclamptic patients by Dera et al, use of L-arginine was associated with lower rate of operative deliveries and higher Apgar scores at both 1 and 5 minutes.[5]

In our study the mean age of women was 25.15±2.63 years with a range from 20 years to 35 years. The average gestational age of the women included in the study was 31.4±1.57 weeks. In our study the mean duration of treatment was a 24.73±3.43 days which was similar to Rinoy Sreedharan et al but lesser than Ropacka et al and in which duration of therapy in study group was 23.99±3.51and 34.1±13.8 days respectively.[3,6]

The mean change in AFI in women in our study was 2.23 ± 0.41 which was similar to the Sreedharan et al who showed mean change in AFI 2.03cm±0.39cm,[6] This suggests that L-arginine could be beneficial in the treatment of oligohydramnios.

The amnioinfusion are not easily available thus for the treatment option L-arginine could be used as an effective method of treatment. This is a non-invasive method and not requiring hospitalization.

CONCLUSION

The present study was done to evaluate effectiveness of L-arginine in increasing amniotic fluid index in cases of oligohydramnios. However extensive long-term studies are required to demonstrate not only its efficacy but also its effect on maternal and perinatal outcome which would help in establishing its role as a potent treatment option for oligohydramnios.

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