

ROLE OF AMINO ACIDS, INTRAVENOUS HYDRATION AND PROGESTOGENS IN OLIGOHYDRAMNIOS AND IUGR.

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ABSTRACT:-OBJECTIVES: To verify and evaluate the role of maternal intravenous infusion of fluids, amino acids and progestogens in increasing the liquor amount and fetal weight in IUGR and oligohydramnios. **METHODS:** 90 patients with USG confirmed oligohydramnios and IUGR were admitted and divided into three groups. Group I was given high protein diet, bed rest, Intravenous fluids Ringer lactate and 5% Dextrose in 2:1 ratio on alternate days. Group II received fluid therapy RL and 5% dextrose in the ratio of 2:1 on alternate days for three days, amino acid drip 100ml twice daily on alternate days for 3 days a week and Group III received fluid therapy and amino acid infusion on alternate days along with natural progestogens 100mg once a week. Liquor was assessed clinically as well as by USG after a week and after 3 weeks. **RESULTS:** Amniotic fluid index increased in Group II and Group III significantly and increase in fetal weight was more so in Group III. Normal deliveries without complications were much more in Group II and Group III. Fetal distress was reduced in Group II and comparatively more so in Group III. **CONCLUSION:** Intravenous infusion of amino acids along with Intravenous fluid therapy given on alternate days as a weekly regime with addition of progestogens to this regime was beneficial to both the mother and fetus in oligohydramnios and IUGR.

INTRODUCTION: IUGR is failure of the fetus to reach genetic potential for growth¹. 24 - 30% incidence in developing country². It is multifactorial, maternal, fetal and placental factors and environmental toxins interfere with normal growth mechanism¹. (8).

Fetus with IUGR has got increased risk of disease³ and death during antenatal, intrapartum, neonatal, paediatric and adult life. Short term morbidities like prematurity, RDS, necrotising

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enterocolitis and long term complications like neurologic disorders, cerebral palsy and poor neurodevelopmental outcome are noted⁴. Low birth weight is associated with coronary heart disease, stroke, hypertension and type II diabetes. 40 - 45% of IUGR are associated with oligohydramnios which adds risk⁵.

Oligohydramnios is where the liquor amnii in amount less than 200ml at term and sonographically AFV is < 10 percentile for gestational age or single vertical pocket < 2cm. Incidence is 7-8% of pregnancies. AFV is a reliable, good predictor of fetal well being. If it occurs in the first half of the pregnancy it is associated with birth defects like potter ' s syndrome and in later half of pregnancy it is associated with poor fetal growth, FHR deceleration, Meconium aspiration syndrome , fetal suicidal syndrome, wry neck, club foot, fetal pulmonary hypoplasia, Intrauterine death, increase in caesarean section rates and perinatal morbidity rates.

IUGR is associated with impairment of uteroplacental blood flow as a result of failure of trophoblastic invasion of spiral arteries, hence blood flow is restricted in the intervillous space⁵.(12). As fetal growth within uterus is influenced by genetic , epigenetic, environmental factors and maternal maturity , fetoplacental resistance through deficiency of nutrients and oxygen from mother to fetus and altered endocrine status results in fetoplacental resistance and vasodilator deficiency ie. Nitric oxide and polyamines. Thus undernutrition of various nutrients such as amino acids, carbohydrates, essential fatty acids play an important role in the development of IUGR.

Amino acids are supplied by the placenta to the fetus which starts developing in the first trimester. In IUGR babies there is decrease in the placental surface area and amino acid uptake. There is a shift in the amino acid transport capacity and metabolic pathways within the fetoplacental unit and has disrupted insulin / IGF signalling in liver and muscle account leading to decreased fetal growth.

Added to it oligohydramnios has a threat to baby's survival. Amniotic fluid bathes the fetus, cushions, provides nutrition and is necessary for the proper growth, development and fetal lung growth and prevents infection. Severe oligohydramnios can lead to fetal death due to poor development of the lung. Autonomic nerve reflexes that get activated results in preferential shunting of blood from splanchnic circulation to brain and heart, as a result of which there is a decrease in pulmonary and renal perfusion. Fetus becomes hypoxic and death ensues.

Progesterone is a smooth muscle relaxant and also has got a vasodilator effect on fetoplacental vasculature⁸ by various mechanisms.

In one study⁸, Progesterone and MPA induced prostacyclin synthesis through dose and receptor related pathways in human umbilical venous endothelial cells and increased endothelial prostacyclin by enhancing cyclooxygenase - 1 & 2 expressions and its activity⁹. There was a lower progesterone level in IUGR group with vascular resistance in the umbilical artery compared with AGA group. Hence by measuring progesterone level and supplying progesterone, there is decrease in the incidence of thrombosis and calcification in the placenta by increasing perfusion.

MATERIAL AND METHODS:

INCLUSION CRITERIA:

Women with IUGR and oligohydramnios were confirmed clinically and by USG.

Gestational age between 28 - 37 weeks of gestation was hospitalized. Detailed history was elicited, examination and investigations were done.

EXCLUSION CRITERIA:

Severe anaemia.

Congenital malformation of the baby

Heart disease

PROM

Twin pregnancy

Severe PIH

GROUP I: 30 Patients : High protein diet Intravenous infusions of RL and 5% dextrose in 2:1 given on alternate days for 3 days in a week.

GROUP II: 30 patients: Intravenous infusion of RL and 5% Dextrose in ratio of 2:1 on alternate days for 3 days in a week. Amino acid drip 100ml twice daily on alternate days in a week for 3 days.

GROUP III: 30 patients: Amino acid drip 100ml twice a week for 3 days Intravenous infusion of RL and 5% Dextrose in 2:1 ratio as alternate days for 3 days. Inj. Natural progesterones 200 mg stat .Later 100mg repeated once in 10 days.

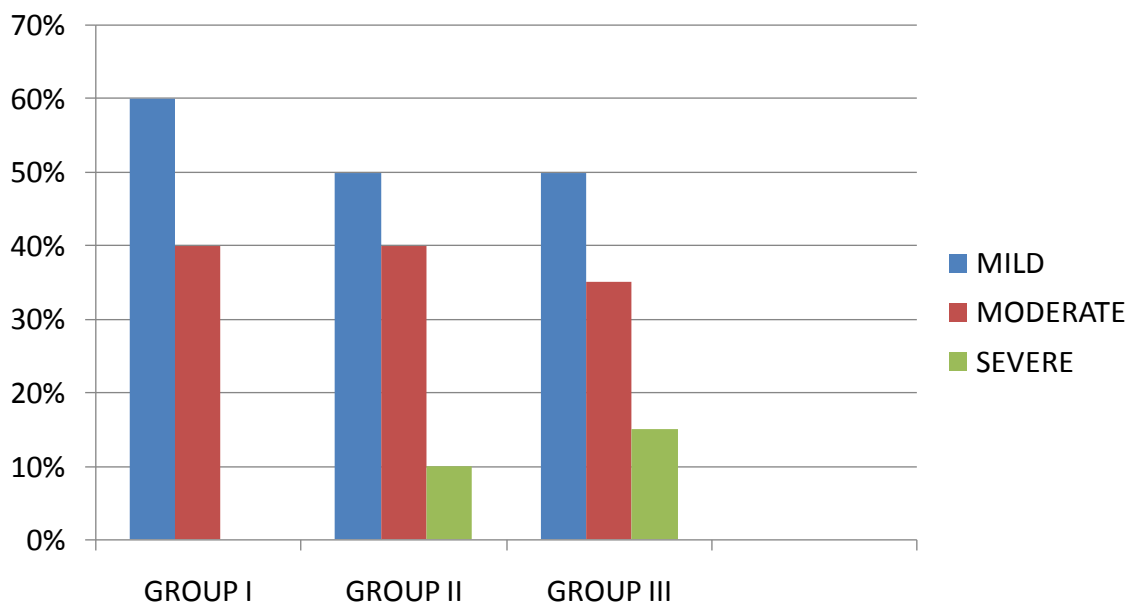
Assessment was done clinically by Gravidogram and USG after 1 WK AND 3 WKS .Patients were followed upto delivery.

RESULTS:

Following were the observations in our study.

Distribution of patients according to IUGR and oligohydramnios.

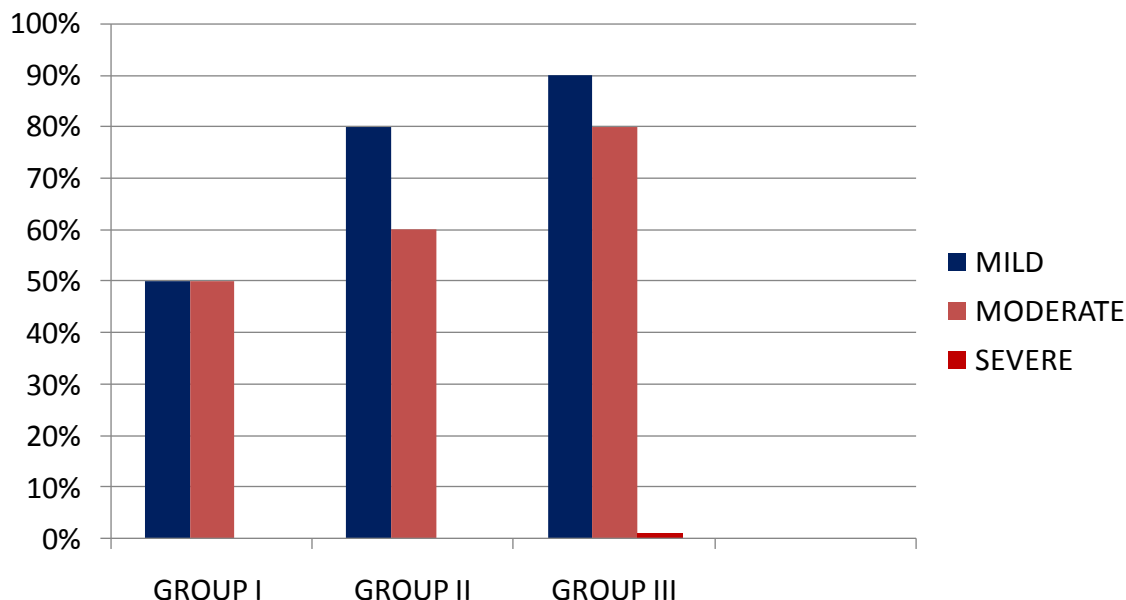
A) Incidence of oligohydramnios associated with IUGR.



B) Post perfusion changes in AFI and fetal weight

There was significant increase in AFI and fetal weight in Group II and group III compared to group I , but in severe oligohydramnios there was no improvement.

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C) Maternal outcome associated with IUGR and oligohydramnios in our study:

	GROUP I	GROUP II	GROUP III
Spontaneous vaginal delivery	6	10	15
Induced labor	7	6	3
Instrumental delivery	3	4	6
Caesarean section	14	10	6

It was observed that in group II and group III there were more normal deliveries and Caesarean section rate was very much reduced when compared to group I.

DISCUSSION: Oligohydramnios is a late sign of fetal malnutrition. It causes chest wall fixation, pulmonary hypoplasia, meconium staining of amniotic fluid, fetal heart rate abnormalities, umbilical cord compression and low Apgar score and fetal acidosis. Added to it IUGR is associated with increase in the perinatal mortality rate. This occurs due to shallow trophoblastic invasion during 14 - 16 gestational weeks of fetus, also causes CV disease and later glucose intolerance in adult life. It has been shown that placental supply of Amino acid is altered in IUGR pregnancies.

Many studies have been conducted at various institutes. One such study conducted at Sher - i Kashmir institute of medical sciences selected proven cases by Ultrasound were administered parenteral amino acids .There was a significant increase in the AFI and decrease in perinatal mortality rate.

Antepartum fetal surveillance by assessing amniotic fluid has become an integral part in the management of oligohydramnios. Improvement in maternal nutritional status and weight gain in

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pregnancy is associated with better pregnancy outcome. Studies have been conducted using different Intravenous infusions like 10% Fructodex and amino acid solutions at Jhalawar Medical College, Jhalawar, Rajasthan, India which showed improvement in AFI. This acts through improved maternal nutritional status which could not have been achieved by diet alone due to noncompliance and low socioeconomic status. Suzuki et al have used 10% maltose. Even American pregnancy association states that maternal hydration increases Amniotic fluid volume. Frank et al proved that hydration was associated with increase in uterine artery mean velocity and thereby increase in uteroplacental perfusion.

Changes in maternal plasma osmolality and volume probably play an important role in determining amniotic fluid volume as demonstrated by near term fetus which increases urine production to maintain fluid homeostasis. So maternal hydration to treat oligohydramnios should be considered and investigated further. Mesaki by using 10% dextrose and 12% amino acid had the same reports of increased amniotic fluid volume as well as fetal weight.

In our study specially in rural setup where majority of cases are anaemic like adding fuel to fire, specially group II and group III had improvement in AFI as well as increase in fetal weight about 500gm compared to group I.

CONCLUSION: From our study we conclude that after infusion therapy with Intravenous fluids, amino acids as a week regimen on alternate days in group II and along with progesterone injection in group III increased AFI as well as fetal weight, thereby having beneficial effect in both the mother and the baby. However still more studies are to be done to prove the role of placenta in amino acid and fatty acid supply to the fetus, thereby relationship to fetal growth. In developing countries as ours amino acid infusion can be used as a tool in reducing maternal morbidity and perinatal mortality.

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