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## Role of L-Arginine In Uteroplacental Vascular Insufficiency

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### ABSTRACT

Placental insufficiency or Uteroplacental vascular insufficiency is a complication of pregnancy when the placenta is unable to deliver an adequate supply of nutrients and oxygen to the foetus and thus cannot fully support the developing baby. It may be caused due to preeclampsia. Placental insufficiency can lead to Intra uterine growth retardation (IUGR) .IUGR is defined as estimated birth weight below 10<sup>th</sup> percentile for gestational age which is quite common. This study aims to evaluate the effectiveness of L-arginine in placental insufficiency

**Keywords:**L Ardenin, uteroplacental

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## INTRODUCTION

Fetal weight is determined by the genetic growth potential, the health of the fetus, the capacity of the mother to supply adequate quality and quantities of substrates required for growth and the ability of the placenta to transport these nutritional substrates to the fetus. The majority of conditions affecting the fetal growth are placental or fetal in origin.

The most common placental conditions are alterations in the uteroplacental and fetal placental circulation. Fetal growth restriction can be divided into 2 types; Symmetrical-When the fetus is small but well proportioned. Asymmetrical – When the fetus's abdominal growth is restricted.<sup>1</sup> The release of local vasoactive molecule Nitric oxide, from endothelium maintains appropriate placental blood flow, fetal nutrition and oxygenation.. Nitric oxide (NO) is constitutively produced in human vein umbilical cells and platelets from conversion of L-arginine to L-citrulline by endothelial NO synthase<sup>2</sup>. It causes cyclic guanosine monophosphate mediated vascular relaxation and inhibits platelet adhesion.<sup>3</sup>

### **Case Report On Effectiveness of L-Arginine In Umbilical Placental Insufficiency**

A 29 year old primi 32 weeks + 4 days period of gestation was admitted in the tertiary care centre in view of IUGR and umbilical placental insufficiency and her USS showed 29 weeks + 2 days. On her hospital stay she was treated with Femargin (L-Arginine 3 g + Proanthocyanidins 75mg ) and B protein (1 tsp BD) .It was observed that after a week ,at the time of her discharge, there was an improvement in the amniotic fluid index which is suggestive of the effectiveness of l-arginine in IUGR.

### **Studies on L-Arginine In Iugr**

Various studies have supported the use of L – arginine in IUGR. Vosatka etal (1998) conducted an experimental study to evaluate the effect of dietary supplementation with L-arginine preventing foetal growth retardation in rats and they concluded that L –arginine ameliorates maternal hypoxia induced fetal growth restriction in the rats<sup>4</sup>. Facchinelt etal (1999) investigated the biochemical and cardiovascular effects of L-arginine administration by infusion in normotensive pregnancy and women with preeclampsia. They observed that l-arginine infusion was associated with significant reduction of blood pressure in both groups. The investigator concluded that L-arginine loading in pregnant women is associated with increase in NO production, I e, vasodilation leading to decrease in blood pressure and increase in uteroplacental blood flow<sup>5</sup>. Rytlewski etal (2005) investigated the influence of dietary supplementation with L-arginine on blood pressure and biochemical measures of NO production. The result of their study showed that after 3 weeks of treatment the values of

systolic ,diastolic and mean arterial blood pressure were significantly lower in group consuming L-arginine as compared with that of the placebo group.<sup>6</sup> However, there also have been some contradicting reports in this field. One of the clinical studies clarifies that the efficacy of L-arginine on IUGR depends on many factors like the degree of severity of IUGR , the root and timing of NO donor administration , and the capacity to enhance arginine availability and NOs or arginase activity.

## CONCLUSION

Many studies reported the beneficial role of supplementation of L-arginine in the IUGR by increasing the synthesis of NO thus causing vasodilation and improving placental ischemia leading to increase in the supply of substrates to the fetus. It has significant effect on the improvement of uteroplacental microcirculation, which obviously can improve the placental oxygen supplying function.

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