

# The different gene expression of HO-1 and iNOS in placenta of Intrauterine growth restriction

Jongyun Hwang, Ji Yeon Lee M.D., Tae-Gu Ahn M.D., Sung Hun Na, M.D.

Department of Obstetrics & Gynecology, School of Medicine, Kangwon National University, Chuncheon, Korea

## Objectives (목적)

Heme Oxygenase (HO) and nitric oxide synthase (NOS) have similarities in some aspects; antioxidant function, generating gaseous molecule (carbon monoxide, nitric oxide), similar isoform. HO and NOS play significant role in placentation, placental angiogenesis and antioxidant protection from oxidative stress in normal pregnancy. Some researcher suggested that HO and NOS may be regulated by mutual isoform enzymes. However, the exact comprehension for the compensatory regulation between two enzymes was deficient. Intrauterine growth restriction (IUGR) is a growth failure of the fetus. IUGR was related to an inadequacy in the supply of nutrients and oxygen from mother to the fetus through the placenta. The common cause of IUGR is a placental insufficiency to result in hypoxia in fetus. We hypothesized that the deficiencies of HO, HO-catalytic products, NOS and NOS-catalytic products may result in IUGR and there is a reciprocal compensatory system in two systems. The aim of this study was to identify the gene expression of HO-1 and iNOS in placenta of IUGR and to evaluate the potential reciprocal compensatory regulation between two systems.

## Methods (연구 방법)

In this study, we designed Case-control study including women with IUGR. The placenta tissue samples were obtained from IUGR patients and normal pregnancy. We quantified gene expression of HO-1 and iNOS on placenta by RT-PCR, real time PCR.

## Results (결과)

In this study, it demonstrates that a significant down-regulation of HO-1 gene expression in placenta when compared to normal placenta. However, we observed a significant up-regulation of iNOS gene expression in placenta when compared to normal placenta.

## Conclusions (결론)

The present study demonstrates that there are different responses to placental insufficiency in two enzyme systems; the down-regulation of HO-1 gene expression and up-regulation of NOS gene expression. We conclude that HO-1 and iNOS system may be regulated by mutual gene expression between two enzymes.