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telomerase

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=ABSTRACT=

Effect of Hypoxia on Telomerase Activity in Placental Tissue
in Pregnancies with Fetal Growth Restriction

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Objective : To observe the difference in telomerase activity (TA) expression in the placenta between fetal growth restriction (FGR) with preeclampsia and those without and to evaluate the effect of oxygen concentration on the TA expression in the trophoblastic cells.

Methods : Telomerase activity was measured in 48 (normal pregnancies, 16; preeclampsia with FGR, 15; normotensive FGR, 17) placentas which were obtained between 32 and 41 weeks' gestations. Trophoblastic cells were extracted from 8 chorionic villi samples obtained from 8-10 weeks' placenta and were cultured in either 2%, 8%, and 20% oxygen atmosphere. Then TA was examined by using telomeric repeat amplification protocol (TRAP) assay.

Results : During 3rd trimester of pregnancy, exhibited TA expression in normal pregnancy, FGR complicated by preeclampsia, and normotensive FGR groups were 11 of 16 (68.8%), 4 of 15 (26.7%), and 4 of 17 (23.5%), respectively. Significantly lower level of TA was detected in the FGR group compared to the normal pregnancies ($p=0.009$), whereas within FGR pregnancies, presence of preeclampsia did not seem to have statistically significant effect on TA expression. TA expression levels were measured by optical density in trophoblasts cultured under various oxygen concentration which revealed that significantly higher TA was exhibited in the cells cultured in 2% oxygen compared to 8% and 20% ($p<0.001$). However no significant difference was noted in TA between cells cultured in 8% and 20% oxygen.

Conclusion : Decreased TA in the placenta from pregnancies with FGR was noted regardless of presence of preeclampsia indicating a probable correlation between FGR and placental senescence. Since increased TA was noted in trophoblastic cells that were cultured in hypoxic condition, we could speculate that the intervillous oxygen tension during early-stage placental development plays a certain role in the placental degeneration in pregnancies complicated by FGR and preeclampsia.

Key Words : Telomerase activity, Hypoxia, Preeclampsia, Fetal growth restriction

Telomere
 tandem DNA repeat TTAGGG
 telomere telomere telomerase
 가
 telomerase
 mitotic clock 가
 1-3
 Telomerase ribonucleoprotein , RNA dependant DNA
 polymerase RNA component template
 telomeric DNA telomere
 1. 1999 3 2000 3
 1.2 32 41
 telomere 가 telomerase 48
 TRAP 가
 telomerase 가 4-7 16
 telomerase 가 17
 (trophoblast) 가 15
 7 Izutsu 8 30
 (fetal growth restriction) telomerase 가 -80
 가 가 가
 telomerase 가 4
 110 mmHg ,
 dip stick 2+ , 24
 4 g
 15 ,
 16
 9 10 percentile
 telomerase 가
 가 가
 10-14
 (intervillous space)
 가 가 30 incubation
 가 , 4 14000 x g 30
 BioRad protein
 assay kit (Bio Rad Lab, Hercules, CA, USA)
 가 freezing vial
 -80