— 143 —

허혈성재관류 신손상시 calcineurin-inhibitor투여가 표피성장인자발현에 미치는 영향

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신장이식에 있어 허혈성 재관류손상 (ischemia-peferpusion injury: 이하 'I/R) 은 이식신의 회복을 지연시키며 이때 calcineurin inhibitor의 투여는 이식신에 더욱 손상을 주는 것으로 알려져 있다. 이에 저자들은 I/R 손상에 있어 calcineurin inhibitor투여가 표피성장인자(epidermal growth factor: 이하 'EGF')의 발현과 세뇨관재생에 영향을 줄 것이라는 가정하에 본 실험을 시행하였다. 4종류의 독립적인 실험을 시행하였다. 첫째, I/R 손상 쥐에서 EGF의 발현을 확인하였고 둘째, I/R 손상쥐에서 세뇨관재생을 관찰하였으며 셋째, calcineurin inhibitor투여에 따른 EGF발현 및 신세뇨관재생을 관찰하였으며 넷째, losartan투여가 calcineurin inhibitor에 의한 EGF발현에 미치는 영향을 관찰하였다. I/R 손상은 쥐의 양측 신동맥을 45분간 결찰함으로써 유도하였고 EGF의 발현은 Immunoblot으로, 신세뇨관재생능은 BrdU의 조직면역학적 염색법으로 하였다.

실험결과는 다음과 같다.

1) I/R 신손상시 EGF발현은 24시간째, 신세뇨관재생능은 48, 72시간째 가장 증가하였다.
2) Calcineurin inhibitor는 EGF발현과 세뇨관재생을 dose-dependent하게 억제시켰다.
3) Losartan투여는 calcineurin inhibitor에 의한 EGF의 억제를 보호하였다.

이상의 결과는 I/R손상시 calcineurin inhibitor투여는 EGF발현 및 신세뇨관재생능을 감소시키며 이때 losartan투여가 효과적이라는 것을 시사한다.

— 144 —

국소성 분절성 사구체경화증에서 Circulating Factor(s)의 규명을 위한 Proteomics 연구

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Background: FSGS often relapses immediately after kidney transplantation, suggesting that a circulating factor or an albuminuric factor is capable of rapidly altering glomerular permselectivity for albumin and/or reproducing the initial histologic lesion on the graft. Because of the lack of a sensitive and reliable assay of its activity, the reproducibility of characterizing the factor was poor and some investigators have failed to demonstrate this albuminuric factor in their well-designed studies. In this study, we attempted to identify the albuminuric factor using an animal model and by 2D electrophoresis.

Method: Plasma was harvested from a patient with FSGS who showed massive albuminuria after renal transplantation during the plasma exchange. To observe the change of rats' proteinuria due to FSGS plasma and to fractionate a portion rich in albuminuric factor, various volumes of plasma A (plasma obtained during initial plasma exchange) and B (plasma during final plasma exchange) were injected into the tail veins of rats.

For a proteomics-bases approaches, immobilized pH gradient was performed with a IPGphor Isoelectric Focusing System. A sample solution was incubated with IPG strips of pH 4-7 and pH 3-10 strip for 12 hours and then was under 8000 Vhr for 2 hours. After running, the IPG strips were equilibrated with SDS equilibration buffer and SDS-PAGE. Silver staining was carried out using the method of Moriesy, and the stained 2-D gels were scanned using an image scanner.

Results and conclusion: Intravenous administration of 3 ml of plasma from the FSGS patient did not induce proteinuria. Also, we could not discriminate any new spot on the 2-D electrophoresis of plasma A and B. The main change of renal pathology was the effacement of the epithelial foot process.

In conclusion, our results suggest that the so called circulating factor is not a protein but an environment, which stimulate cytokines that may influence glomerular epithelial cell foot process effacement.