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Coenzyme Q10이 Sirolimus에 의해 유발된 췌장 손상에 미치는 영향

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The Effects of Coenzyme Q10 in Sirolimus-Induced Pancreatic Islet Injury

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Background: This study was performed to investigate whether coenzyme Q10 (CoQ10) has a protective effect in an experimental mouse model of sirolimus-induced pancreatic injury.

Methods: Male Sprague-Dawley rats fed a low-salt diet were divided in five groups: group 1 (control, n=9), group 2 (SRL; sirolimus group, n=9), group 3 (SRL+ CoQ10; sirolimus treated by coenzyme Q10, n=9), group 4 (SRL+MET; sirolimus treated by metformin, n=9) and group 5 (SRL+MET+CoQ10; sirolimus treated by metformin and coenzyme Q10, n=9). Sirolimus-induced pancreatic injury in rats was induced with daily treatment of rapamycin (0.3 mg/kg, s.c.) for 28 days, and CoQ10 (20 mg/kg, p.o.) or metformin (250mg/kg, p.o.) was treatment alone or combination for 14 days. The effect of metformin and CoQ10 on rapamycin-induced pancreatic injury was evaluated by assessing intraperitoneal glucose tolerance test (IPGTT), plasma insulin concentration and the homeostatic model assessment of insulin resistance (HOMA-IR) index. An IPGTT was performed at the end of the 4 week treatment period, and the area under the curve of glucose (AUCg) was calculated by trapezoidal estimation from the values obtained in the IPGTT.

Results: Four weeks of rapamycin treatment increased blood glucose levels and the HOMA-IR. Calculated AUCg was lower in SRL+MET group and SRL+MET+CoQ10 group than in SRL group (414 vs 314 vs 289 mg/dl min, $p<0.05$). However, Calculated AUCg did not differ significantly between the SRL group and CoQ10 group (414 vs 381 mg/dl min, $p>0.05$). Comparing HOMA-IR between SRL+MET group and SRL+MET+CoQ10 group, the value of SRL+MET+CoQ10 group was lower than that of SRL+MET group (0.53 vs 0.59, $p>0.05$).

Conclusion: Co-administration of CoQ10 and metformin seems to have more beneficial effect against rapamycin-induced pancreatic injury than metformin single therapy.

Key Words: 코엔자임, 시로리무스, 췌장
Coenzyme Q10, Sirolimus, Pancreas