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Synergic effects of epigallocatechin gallate and dipeptidyl peptidase IV inhibitor on tacrolimus-induced nephrotoxicity in mice

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Objectives: It has been reported that the proteinuria is an early predictive marker in detection of tacrolimus (TAC) nephrotoxicity. The aim of this study was to investigate the renoprotective effects of epigallocatechin gallate (EGCG) and dipeptidyl peptidase IV (DPP IV) inhibitor gemigliptin on TAC-induced acute nephrotoxicity in mice.

Methods: : The mice (n=20) were divided into 5 groups (n=5/group); control group were intraperitoneally (IP) injected 0.9% saline, TAC group were IP injected TAC 2 mg/kg, DPP IV inhibitor group were given in addition gemigliptin 20 mg/kg (G20) by oral gavage. TAC-EGCG group were given TAC by IP injection and EGCG 100 mg/kg by subcutaneous injection. TAC-EGCG-G20 group were given with same dosages.

Results: The 24 hours urine protein amounts were significantly increased in TAC group (46.1 ± 10.9 mg/day) compared to control group (11.3 ± 4.4 mg/day) and significantly decreased in TAC-EGCG-G20 group (13.1 ± 5.9 mg/day, $P < 0.01$) compared to TAC group. The nitric oxide production by TAC was significantly suppressed by EGCG and gemigliptin management. Renal tissue malondialdehyde level was significantly increased in TAC group compared to control group and significantly decreased in TAC-EGCG-G20 group compared than that of TAC group. The renal function and antioxidant enzyme activities were significantly suppressed in TAC group compared with control group and restored in EGCG and gemigliptin treatment group.

Conclusions: : EGCG and gemigliptin treatment has synergic effects with antiproteinuric and renoprotective impacts on TAC-induced acute renal injury in mice.