S-C1

Paricalcitol의 신손상 보호효과에서 catalase의 역할

고려대학교 안산병원 신장내과[1], 원광대학교 산본병원 신장내과[2]

강영선[1], 기정연[1], 김정은[1], 민혜숙[1], 김성진[1], 이지은[2], 김현욱[2], 차대룡[1]

Paricalcitol has the Renoprotective Effect Related to Catalase Pathway in Kidney Injury

Young Sun Kang[1], Jeong Yeon Gee[1], Jeong Eun Kim[1], Hye Sook Min[1], Seong Jin Kim[1]
Ji Eun Lee[2], Hyun Wook Kim[2], Dae Ryong Cha[1]

Korea University Ansan Hospital, Department of Nephrology[1]
Wongang University Sanbon Hospital, Department of Nephrology[2]

Background: Paricalcitol, vitamin D receptor agonist, is known to play an antioxidative role in tissue injury. Recently catalase overexpression or deficiency mice model have showed interesting results of its antioxidative role in several reports. However, there is no data for the roles of paricalcitol in the diabetic complication related to them of catalase. Therefore, we investigated the effect of paricalcitol on the oxidative stress of diabetic nephropathy in catalase knock-out diabetic mice.

Methods: 8-week-old catalase knock-out (CKO) C57/BL6 mice and wild-type (WT) mice were treated by intraperitoneal streptozotocin (50 mg/kg/day) injection for 7 days. After inducing of diabetes, they were treated by intraperitoenal paricalcitol injection for two months. They were grouped into follows: I) WT 2) CKO 3) CKO+paricalcitol 4) WT+STZ 5) WT+STZ+Paricalcitol 6) CKO+STZ 7) CKO+STZ+Paricalcitol.

Result: Body weight, blood pressure, heart rate, fasting blood glucose level were not significant among groups. Organ weights and urinary volume were also similar among groups. However, interestingly, urinary albumin excretion was more increased in CKO than WT mice and reduced significantly by paricalcitol treatment. These changes were also observed in STZ-induced diabetic mice. Gene expressions of MCP-1, IL-10, TGFβ and type IV collagen were inhibited by paricalcitol treatment in diabetic CKO mice. These results were consistent with protein expressions of TGFβ and PAI-1 by western blot analysis and immunohistochemistry. In addition, HbA1c, glucose tolerance test, and insulin tolerance test were of interest significantly improved by paricalcitol treatment in diabetic CKO mice. However, both lipid contents and liperoxidase of kidney tissue were reduced only in non-diabetic CKO mice by paricalcitol, but not in diabetic CKO mice. In addition, urinary 8-isoprostane level was also dramatically decreased in non-diabetic CKO mice by paricalcitol, but which did not induce any change in diabetic CKO mice.

Conclusion: Altogether, these results suggest that the kidney injury associated with catalase deficiency was improved paricalcitol treatment in both diabetic and non-diabetic nephropathy. However, paricalcitol has the renoprotective effect through independent of the antioxidative role of catalase in diabetic nephropathy. Further study should be investigated about them.

Key Words: 카탈라제, 비타민 D, 당뇨병성 신증, 산화스트레스
Catalase, Vitamin D, Paricalcitol, Diabetic nephropathy