KSN 2016 Abstract Submission

Glomerular disease

KSN2016ABS-1234

The therapeutic effects of CCR2KO in the development of obesity-induced kidney injury

Seung Joo Lee*[1], Hong Min Kim[2], Eun Soo Lee[2], Jeong Suk Kang[1], Seung Seob Son[1], Ah Reum Jeong[1], Choon Hee Chung[2], Eun Young Lee[1]

[1]Department of Internal Medicine, Soonchunhyang Universitty Cheonan Hospital, Cheonan, [2]Department of Internal Medicine, Yonsei University Wonju College of Medicine, Wonju, Korea, Republic Of

Background: In recent years, obesity has become an important health problem in worldwide. Obesity leads to kidney disease through various pathways. The effects of CCR2 knockout (CCR2 KO) in obesity-induced kidney is unclear. In this study, we investigated the mechanism of CCL2/CCR2 signaling and therapeutic effects on obesity-induced kidney injury.

Methods: We used C57BL/6 and CCR2 KO mice (n=9). Mouse were divided into four groups; Regular diet wild type (RD WT), RD CCR2 knockout (RD KO), high fat diet wild type (HFD WT), HFD CCR2 knockout (HFD KO). The effect of CCR2 KO on albuminuria and biochemical characteristics were measured by ELISA. The structural changes on kidney were examined by immunohistochemistry and EM.

Results:

Body weight in HFD WT was significantly increased compared to RD WT, but not decreased in HFD KO. HFD KO groups were significantly improved fasting blood glucose level. In case of tissue weights, WAT in HFD groups were markedly increased but other tissues were not increased in HFD groups. Increased insulin, glucose, total cholesterol and triglycerides levels in HFD WT were decreased in KO groups. HFD-induced albuminuria was significantly improved by CCR2 knockout. In the HFD groups, glomerular hypertrophy was observed but glomerular volume levels were not significantly changed between HFD WT and HFD KO. Increased desmin expression and macrophage formation in HFD WT were reduced by HFD KO. HFD-induced glomerular basement membrane thickening and podocyte effacement were improved in CCR2 depletion. Insulin resistance and increased insulin secretion showed in HFD groups were significantly improved in HFD KO groups.

Conclusion: The results suggest that preventing CCL2/CCR2 signaling has a therapeutic effect in obesity-induced kidney injury.

This research was supported by Basic Science Research Program through the National Research Foundation of Korea(NRF) funded by the Ministry of Education (2015R1D1A1A02060785, 2015R1A6A1A03032522).

Keywords: Obesity, Kidney, CCR2, Albuminuria